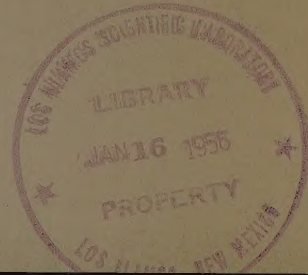


JANUARY 16, 1956

# STEEL

The  
Metalworking Weekly

A PENTON PUBLICATION



## Metal Fatigue

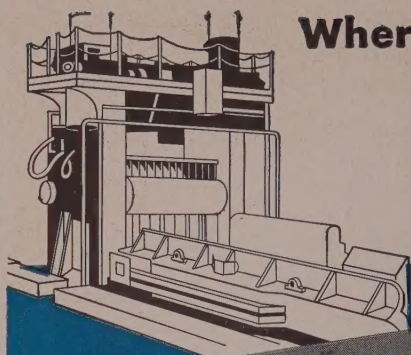
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# Where **Severe Duty** **IS NORMAL DUTY**

## **ALLIS-CHALMERS** **Type 260 DC** **CONTACTOR**

### **HANDLES REPEATED OVERLOADS WITH EASE**

Extra overload capacity . . . extra durability and reliability have been built into this heavy duty contactor — to make your roughest dc drive a smooth running, precision operation . . . to assure maximum production and quality with a minimum of outage time and maintenance. Principal component on the Allis-Chalmers constant potential panel, the Type 260 dc contactor is a rugged unit engineered to withstand punishing current surges inherent in steel mill auxiliary drive operation.

### ***Here's Why!***

- **Quick quenching minimizes contact burning** — Arc centering blowout uses thermal convection and magnetic action to stretch, cool and extinguish arc. Rapid circuit interruption minimizes burning and pitting of contacts.
- **All current-carrying parts silver to silver** — Main contacts are high density forged copper, plated with silver for dependability and extended life. Auxiliary contacts are solid silver . . . need no dressing.

● **Magnet coil designed for continuous duty at 110% of rating** — Coil layer wound with insulation between layers . . . vacuum impregnated to resist moisture and abuse. Operates contactor at less than 80% of rated voltage when hot. Holds at 20% of normal voltage.

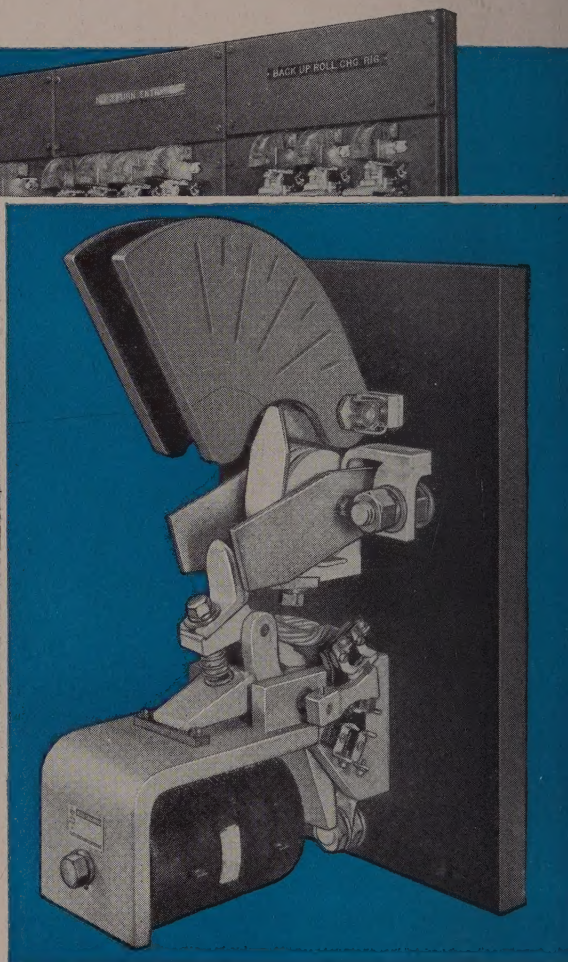
● **Other features.** Rolling contact action. Arc handled on tips, current on clean heels . . . no destructive scuffing. Design simplicity eliminates troublesome linkages, arms and pivots. Lifetime *Oilite* shaft bearings need no lubrication. A-4326

### **SIMPLIFIED ROUTINE INSPECTION**

Keeping the Type 260 contactor in top operating condition is merely a matter of preventive maintenance through routine inspection. All components are readily accessible. Arc chute lifts off to expose contacts which may be removed by loosening one bolt. Auxiliary contacts are mounted on contactor frame in full view. Operating coil is held by a single bolt.

For complete information, call your nearby Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

# **ALLIS-CHALMERS**







## Three Forgings That Support the Globe

In Greek mythology, Atlas was charged with the job of holding up the heavens, but right here in our own day and age is a "world" supported by forgings. It is a huge and wondrous globe that stands on the campus of Babson Institute of Business Administration, Wellesley, Mass. Its size may be judged by the people standing beneath it in the picture.

The vividly colorful globe is built to a scale of 1 inch to 24 miles. It can revolve to simulate the daily rotation of

the earth on its axis. It also moves around a circular track to demonstrate the earth's orbit.

Holding the globe at its proper "tilt" is a six-ton assembly consisting of shaft, socket, and lower bearing support. All these components are forgings made and finish-machined by Bethlehem. The mounting and carriage are also products of Bethlehem shops.

Tonnagewise, the forgings in this exhibit are small. But as we've said so

often, our shops welcome the lightweight jobs, and give them the same careful handling as the heavy-tonnage items. We have produced some of the biggest forgings on earth, and some of the smallest. No matter what size you may need, or what type, we will always be glad to take care of your requirements.

**BETHLEHEM STEEL COMPANY**  
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

# BETHLEHEM STEEL

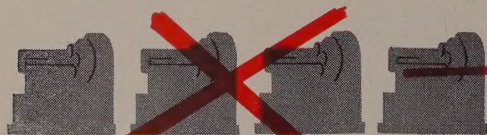




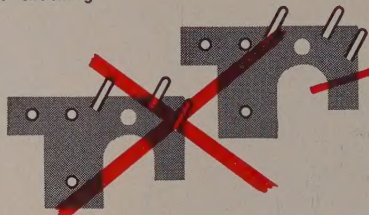
# LOOK AT THESE SAVINGS

## MADE ON THIS STATOR BLADE CARRIER WITH CENTRAL FOUNDRY SHELL CASTINGS

The new method of mold-making called shell-cast, now being employed extensively here at Central Foundry Division makes possible many savings. The method is this: A thin shell of sand bonded by a thermo-setting plastic, forms the mold. This shell has a hard, smooth surface as accurate as the pattern itself, and results in castings with greater uniformity, much closer tolerances, and clean, sand-free surfaces. A typical example of savings the new-type mold makes possible is shown in this Stator Blade Carrier. By having it shell-cast by Central Foundry Division, savings were effected in six figures. With the shell casting process finish allowances were reduced so that preliminary rough machining was eliminated and only finish machine operations were required. Thus machinery, tools, and man-hours and even freight were substantially reduced.



Shell castings eliminated rough cuts thereby saving the capital investment of four vertical chucking machines.

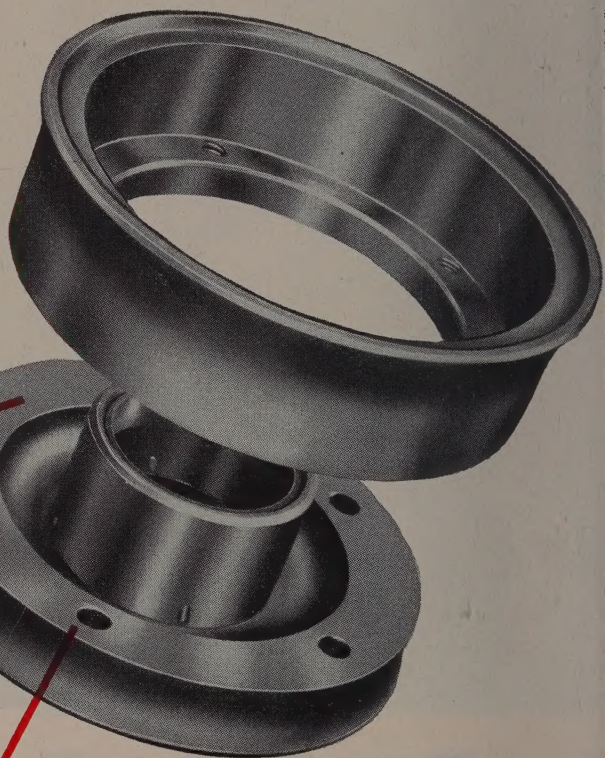


Shell castings saved a substantial amount of jigs and fixtures plus day-to-day perishable tools.

Shell castings made a sizable saving on each part due to reduction of labor time and tooling expense.



Closer finish allowances due to shell castings meant less unit weight adding up to substantial freight savings.



The savings made on this grey iron part are typical of what uniform Central Foundry Division shell castings can do for you. Obviously, savings are the greatest . . . as they were here . . . when the original design is planned for a shell casting, before tooling up.

There are many advantages from Central Foundry Division shell castings. For further information about either shell or sand casting or about any type of castings in grey iron, malleable iron or ArmaSteel write for descriptive literature . . . or request personal help from our experienced engineers, without obligation.



## CENTRAL FOUNDRY DIVISION

GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 20





Traveloader placing heat-exchanger tubes on "Christmas Tree" racks to conserve yard storage space.

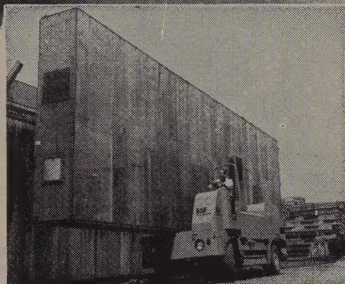
# Traveloader...solves handling of bulky, heavy loads

Here is a revolutionary new material handling machine designed expressly for long, unwieldy awkward loads. It picks up loads from the side, carries them securely on the truck deck, and stacks them to a height of 12 feet. It operates indoors or outdoors, in 10 foot aisles, over paved or unpaved roadways—and over highways at speeds up to 30 MPH!

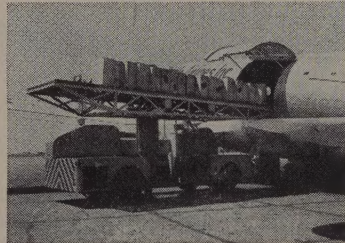
Traveloader is available with gas or diesel powered engine, in 10,000 and 12,000 pound capacities. Write for descriptive bulletin No. 1360.

## No other ONE machine offers these features:

1. A ONE MAN operated lift truck and transporter.
2. SIDE LOADING for straight line pick-up and delivery.
3. CARRIES LOADS equally distributed over two axles and four pneumatic-tired wheels.
4. TRAVELS with payload up to 30 MPH.
5. STACKS LOADS 12 feet high from 10 foot aisles.



Airplane wings crated for shipment are easily handled by Traveloader.



Traveloader with master pallet and roller conveyor speeds loading of aircraft.

**Baker®**

handling equipment

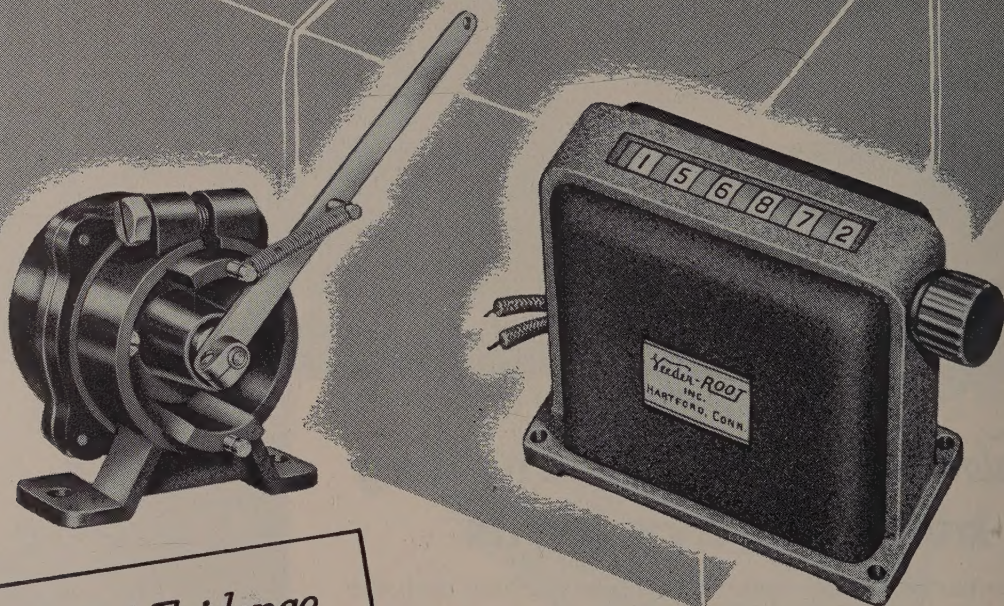
**THE BAKER-RAULANG COMPANY**

1259 WEST 80th STREET • CLEVELAND 2, OHIO

Subsidiary of Otis Elevator Company



# Here's the Complete "Package" for Counting Electrically...



*Added Evidence  
that —*

## Everyone Can Count on **VEEDER-ROOT**

This Veeder-Root Reset Magnetic Counter (AC or DC) is actuated through electromagnets. And it may be connected in series with any device having a contact arrangement . . . like the specially designed Veeder-Root Electrical Contactor at the left, which insures positive operation of the counter, either in oscillation or connected directly to a revolving shaft . . . with the counter placed at

any distance from the machine or process on which the count is required.

This is another one of the hundreds of Veeder-Root Standard and Special Counting and Computing Devices developed for every conceivable counting duty, in every field from atomics to electronics.

What do you need to count? Just write:

**VEEDER-ROOT INCORPORATED**  
HARTFORD 2, CONNECTICUT



Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.  
Montreal 2, Canada  
Offices and Agents in Principal Cities  
"The Name that Counts"



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**A MARK  
to  
Remember**



For over three quarters of a century, the Seymour trade mark has been a symbol for the finest quality NICKEL SILVER — PHOSPHOR BRONZE — BRASS — NICKEL ANODES — BRIGHT NICKEL PROCESSES — WELDING RODS and other non-ferrous products.

It has also been a symbol for Seymour SERVICES — speedy, same-day acknowledgment of orders and inquiries — expert engineering and metallurgical help in selecting and specifying non-ferrous metals for special applications.

Fine, dependable products and fast, friendly service... these are the qualities which have made the Seymour sunburst a trade mark to remember.

In the months ahead you will see and hear a lot more about Seymour and the products it manufactures. The news will come from Seymour distributors and Seymour representatives.

Watch for it. Listen for it.  
MARK IT WELL!

**THE SEYMOUR MFG. CO.**

**500 FRANKLIN STREET**

**SEYMOUR, CONN.**

**NEW YORK SALES OFFICE:**

**CHANIN BUILDING — CABLE, SEYMOURCO**



QUANTITY  
PRODUCTION  
OF  
GREY IRON  
CASTINGS

ONE OF THE  
NATION'S LARGEST  
AND MOST MODERN  
PRODUCTION  
FOUNDRIES

ESTABLISHED 1866  
**THE WHELAND  
COMPANY**  
CHATTANOOGA 2, TENN.

**Do you save  
money when  
you by-pass your  
distributor?**

See Page No. 20

OWNER  
MANAGED...

**LORD BALTIMORE  
HOTEL**

Stands to reason . . . owner operation logically assures you a more personal attention to your comfort and convenience. Teletype BA263

## behind the scenes



### Looking Backward

Genial Harold Rowland, STEEL's advertising director, recently sent out a mailing piece to our advertisers and their agencies. Admittedly, this smashing news rivals in interest the report that ice may be found in Greenland, but before you say "so what," wait for the gimmick.

Harold's letter was dated "New Year's Day, 1966," and it said, in part: "Let's consider the dateline above is correct. This is Jan. 1, 1966 . . . and we are looking back.

"We're seeing a fabulous America that has grown almost 20 per cent, to a population of nearly 187 million!

"We've seen tremendous strides made as our annual Gross National Product has grown more than \$180 billion greater than it was ten years ago!

"And every four weeks throughout the decade, we've seen the equivalent of a Canton, O., added to our U.S.A.!

"Back in '56 these predictions seemed fantastic. But when we look back ten years from today, we'll probably find they were conservative."

### Adds New List

Claude Schaffner, president of the Schaffner Advertising Agency, New Haven, Conn., received one of these letters, and it sent him leaping for a new quill and fresh sheet of foolscap.

"Dear Mr. Rowland," he wrote. "I say amen to your look-backs. Here are ten of mine:

"1. Passing of the gangsterism thought in industry and labor management.

"2. The beginning of the end of beverage booze.

"3. The back of our hand for juvenile punks.

"4. About-face in the march of statism.

"5. End of tax and dues collecting for industry.

"6. Closer check on the manufacture and sale of explosives and war materiel to 'firebrand' countries.

"7. A speed-up in the development and manufacture of the Convertiplane.

"8. Better consolidation of religions on major national issues.

"9. A decrease in back-breaking labor throughout the country.

"10. The end of smog!"

Mr. Schaffner added that there were other look-backs, but they hadn't come to mind. This gives us an opportunity to alert our half dozen faithful readers, and invite them to list the things which, in their opinion, will be gone with the wind in 1966, or will be part of our daily living. For a start, we'd like to see the end of "cute" Christmas phonograph records, and full development of the one-man helicopter. What are *your* look-backs?

### Frustrated Serpents

The E. I. du Pont de Nemours & Co. is not an outfit to let grass grow under its feet when new markets beckon. A product information release informs us that it looks with favor on a nifty, lightweight, re-usable snake-bite kit—just the thing to have in your vest pocket when poisonous snakes happen to be biting you. The kit is manufactured by the B. F. McDonald Co., Los Angeles. Du Pont's only interest in the deal is in Zytel, a nylon resin plastic from which the kit is molded.

Zytel is light in weight, extremely tough and can be sterilized in boiling water. Through careful use and management of your snake-bite kit, you can allow yourself to be bitten again and again in safety, if not in comfort.

### Ten-Letter Word

Now that the holidays are over, perhaps we can catch up on our puzzles. The respective ages of our young cannibals were: Mbingo, 8; Mbango, 5; Mbongo, 3. The numerals the Miller boys wore on their sweaters were, Horatio, 6; Ambrose, 2; Androcoles, 9. George W. Frederick, Republic Steel Corp., Moline, Ill., got the correct numbers back so fast you would think he was coach in charge of sweatshirts. Here's an oldie to play with. Take the letters in "ROAST MULES," and assemble them into one other word. As far as we know, there's only one word that fits.

*Shrdlu*

(Metalworking Outlook—Page 31)



# NEW



## G.E. Announces New Induction Heaters

COMPARE THESE PRACTICAL DESIGN FEATURES

DESIGN FEATURES	G.E.	Mfg A	Mfg B	Mfg C	Mfg D	Mfg E	Mfg F
High KVA Oscillator	✓	✓	✓		✓		
Built-in Water-to-air Heat Exchanger	✓						
Readily Accessible For Maintenance	✓		✓		✓	✓	✓
Four Models in Each Rating	✓						
Totally Enclosed Aluminum Oscillator Box	✓		✓		✓	✓	✓
Dust-tight Cabinet Construction	✓					✓	
Industrial-type Oscillator Tubes	✓	✓	✓	✓	✓	✓	✓
Filament Voltage Regulation of $\pm 3\%$	✓		✓		✓	✓	✓
Water Flow Switch to Protect Oscillator Tube	✓			✓	✓	✓	✓
Three Instruments on Control Panel	✓	✓		✓	✓	✓	✓

Annealing, brazing, soldering, or hardening—whatever the job, G.E.'s new line of electronic induction heaters will help you do it faster, more economically. This new line features four models in each of four ratings ( $7\frac{1}{2}$ -, 15-, 25-, 40-kw) to let you pick the model you need—without wasted investment. Compare (left) this partial list of practical design features with six other leading induction manufacturers, and see why—G.E. gives you **MORE KW FOR YOUR HEATING DOLLAR**. For more information, contact your nearby G-E Apparatus Sales Representative.

Section A722-3, General Electric Co., Schenectady 5, New York

FREE—New bulletin "New G-E Induction Heaters" GEA-6388.

Name

Company

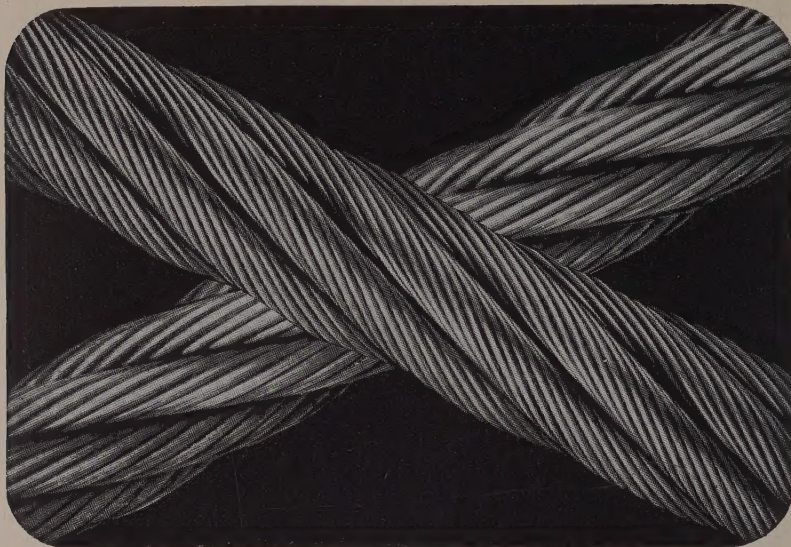
Street

City  State

GENERAL  ELECTRIC



**FIRST WE DEVELOPED 1105 ROPE WIRE.**



**THEN WE MADE ROEBLING'S**

*Royal Blue*



**WIRE 1105 ROPE**

**1105** takes Royal Blue out of the ordinary wire rope class.

**1105** is a rope wire that's new — that's stronger. It's the biggest news in many years.

**1105** is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

*Contact your Roebling distributor or write us for the full story.*

**ROEBLING**

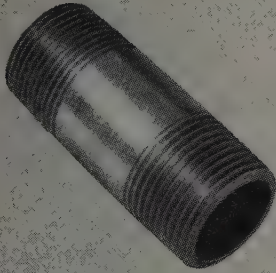
*Subsidiary of The Colorado Fuel and Iron Corporation*



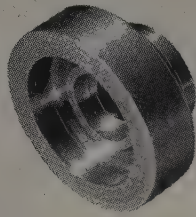
**JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J.** BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.



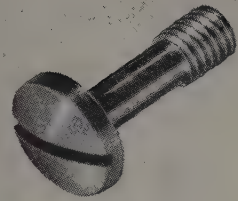
**HERE'S PROOF  
OF VERSATILITY**



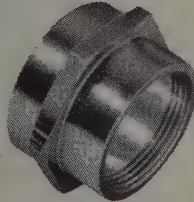
**STEEL PIPE NIPPLE**



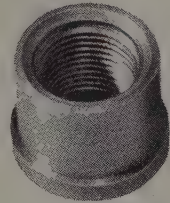
**NITRALLOY-G STEEL**



**416 STAINLESS**



**ALUMINUM**



**SAE 4130**

## **SUN DEVELOPS VERSATILE NEW CUTTING OIL FOR SCREW MACHINES AND JOB SHOPS**

**New cutting oil, Sunicut 5534, is moderately priced...gives  
excellent machining results on wide range of steels**

**New Sunicut 5534** is a non-emulsifying, transparent cutting oil specially compounded to give above-average machining results to operators who want a single oil to machine a large variety of ferrous metals.

**Tests have proved** that new Sunicut 5534 meets this demand for an all-purpose cutting oil. It is ideal for general screw machine and turret lathe work. It is also excellent for tapping, drilling, threading, and light stamping operations. In addition, new Sunicut 5534 can be used on many special machining jobs, both high and low speed, with metals ranging from B1112 to 4130 as well as free-machining stainless steels.

**For complete information** about new Sunicut 5534 and how it can help you reduce your oil inventories...lower your production costs...see your Sun representative. Or write **SUN OIL COMPANY**, Phila. 3, Pa., Dept. S-1.



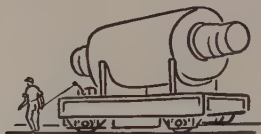
**INDUSTRIAL PRODUCTS DEPARTMENT**

**SUN OIL COMPANY, PHILADELPHIA 3, PA.**

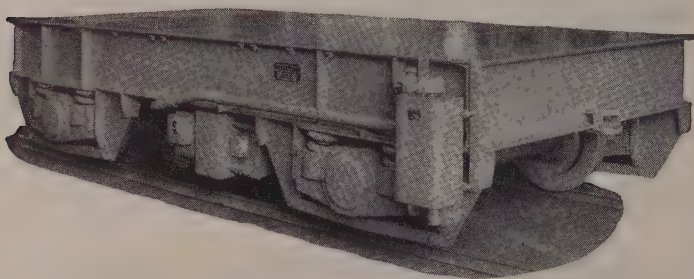
**IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL**



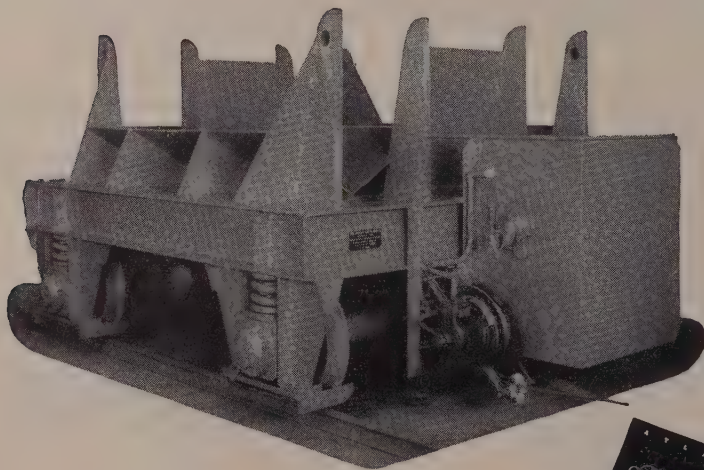
# TRANSFER IT SAFELY at Less Cost with **ATLAS**



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



**50-TON STORAGE BATTERY FLAT CAR**



**64-TON ELECTRIC FLAT CAR**



Request "Walk-Along" Bulletin 1283

**THE ATLAS CAR & MFG. CO.**

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

## LETTERS TO THE EDITORS

### New Tool Steel Guide

Would you please send me your *Guide for Selecting Tool Steels and Carbides*, printed in 1952? This is valuable in my work as a die-casting, die-and-gage and tool-fixture-layout inspector. If a later publication is out, I would rather have it.

Robert Heun  
3172 S. 35th Street  
Milwaukee

• The new edition of this guide is coming out in March of this year.

### Engineers Have Problem



Your article, "Unrest Among Engineers" (Dec. 26, page 29), interests me. Many of your points I have used over a negotiating table to bring forth the problem of our engineers. I would appreciate a few copies.

H. Lauterbach  
151 W. Mt. Royal Rd.  
Milwaukee 17, Wis.

... your statistics were most interesting and should be a big help in our college recruiting program.

G. R. Ginder  
Asst. Plant Industrial Engineer  
U. S. Steel Corp.  
Gary, Ind.

I would like three copies. I think you have touched on several important points.

Virgil E. Bottom  
Director, R & D  
Semiconductor Prod. Div.  
Phoenix Research Laboratory  
Motorola Inc.  
Phoenix, Ariz.

This is an outstanding article. We would appreciate ten copies.

C. J. Brillinger  
Dir. of Training & Education  
York Corp.  
York, Pa.

### Information About Leasing

If reprints of the article, "Blow to Equipment Leasing" (Nov. 21, page 52), are available, we would appreciate a copy. You have done well in putting this informative article together.

Ib Jensen  
General Sales Manager  
Riehle Testing Machines Div.  
American Machine & Metals Inc.  
East Moline, Ill.

### Series Is Valuable

I would appreciate one copy of each of the ten articles in your 1955 Program for Management series so I can file them separately. This material is valuable for my courses in cost control

(Please turn to page 12)

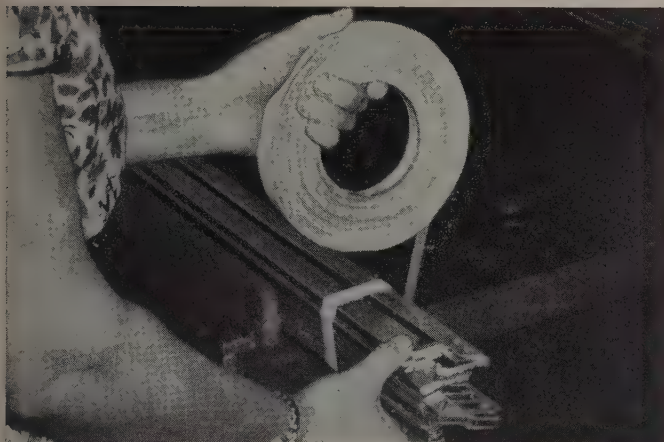




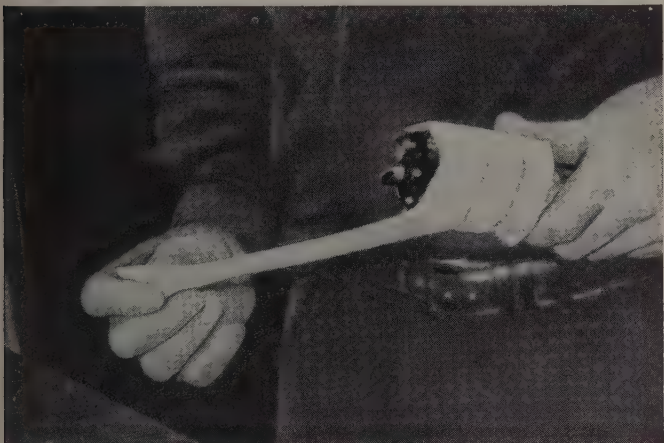
Polyken Tapes have

# CONTROLLED STRENGTH

(and that's what saves the money)



Controlled Strength solves packing problems. This job of bundling aluminum strips requires only a narrow strip of Polyken Tape No. 113,  $1\frac{1}{2}$  times the circumference of the bundle . . . at a considerable saving of time and tape.



Controlled Strength offers greater protection. These cutting tools are guarded with a durable, abrasion-resisting sheath of Polyken Tape No. 113. Twice as much of a fragile tape wouldn't give stored tools equal protection.

# Polyken<sup>®</sup>

**CONTROLLED STRENGTH**

## INDUSTRIAL TAPES

THE KENDALL COMPANY, POLYKEN SALES DIVISION

### CONTROLLED STRENGTH:

the right combination of backing  
and adhesive to give you "all work  
— no waste"

Here's how it can help you: Because you can select the right Polyken Tape for the right job, you get all the sticking power . . . all the tensile strength . . . all the tear resistance you need. When you need special qualities, there's a Polyken Controlled Strength Tape that has them.

That way—the Controlled Strength way—you do the job *right* for the *least* amount of money.

Take Polyken No. 113 as an example. See how this low-cost tape works harder . . . and more efficiently . . . through its "just right" application to the job at hand (whether it is sealing, holding, bundling or protection).

In fact, plant surveys show this tape is being used for more than 245 specific applications—all at a savings!

Use this convenient coupon to find out how Polyken Controlled Strength Tapes can mean "all work—no waste" on the job for you.

Polyken, Dept. S-A  
222 West Adams St., Chicago 6, Illinois

Please send me physical properties and further information on Polyken Controlled Strength Tapes.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



# Program for Management .. 1956

Your sleeves are rolled up. You're expecting another record year. Manufacturers' sales in metalworking will reach \$138 billion—an 8 per cent gain over 1955.

Your industry is starting up a new expansion slope. Its getting bigger. Your problems are becoming more complex.

STEEL's 1956 Program for Management theme—Expansioneering, How to Plan Your Growth—can act as a catalyst for your scientific management planning for the coming months and years. Can you afford to miss the following?

**Feb. 13**

## **IT'S TIME TO GROW**

When, How and Where to Expand

**Mar. 19**

## **KNOW YOUR COSTS**

Avoid Profitless Prosperity

**Apr. 23**

## **IDEAS FOR INDUSTRY**

The Key: Creative Thinking

**May 14**

## **METALWORKING GOES TO MARKET**

Distribution Problems Grow with Development

**June 18**

## **NEW HORIZONS FOR METALWORKING**

Technological Gains Open Larger Markets

**July 16**

## **HOW TO LIVE WITH SUP**

Can It Be Converted to a Benefit?

**Aug. 13**

## **TO MERGE OR NOT TO MERGE**

A Study of the Pros and Cons

**Sept. 24**

## **MOTIVATING MEN TO PRODUCE MORE**

Which Incentives Will Bring Results?

**Oct. 15**

## **AUTOMATION—BOGEYMAN OR BONANZA?**

A Study of the Social and Economic Aspects

**Nov. 12**

## **INDUSTRY AND COLLEGE—PARTNERS IN DEVELOPMENT**

The Result: Better Men for Industry

## LETTERS

(Concluded from page 10)

and management planning. Most of the articles are really excellent.

Ernest H. Weinwurm  
Associate Professor  
College of Commerce  
De Paul University  
Chicago

Please forward one copy of each article in the series. I find them informative and well worth keeping.

R. J. Miller  
City Auto Stamping Co.  
Toledo, O.

## Conservation Piece



May I have three copies of the article, "Lacquer Boosts Vacuum Finishing" (Dec. 5, page 124). Such information is handy reference material which we use in talking to our customers.

L. A. Strobel  
Industrial Heating Engineer  
Detroit Edison Co.  
Detroit

## Coating for Resistance

We wish to compliment you on the article, "War on Wear" (Nov. 28, page 98), and we would like more information on Aldip and Alumicoat aluminum coatings for hot wear resistance.

C. E. Horner  
Chief Metallurgist  
Chemical & Physical Section  
Electronic Tube Division  
Westinghouse Electric Corp.  
Elmira, N. Y.

•We are forwarding the articles, "Dip Valves for Higher Performance" (Oct. 11, 1954, page 114) and "Aluminum Guards the Surface" (July 25, 1955, page 110). The Arthur Tickle Engineering Works Inc., 21 Delavan St., Brooklyn, N. Y., is the only licensee we know of. General Motors Corp. holds the patent.

## Product Being Withdrawn

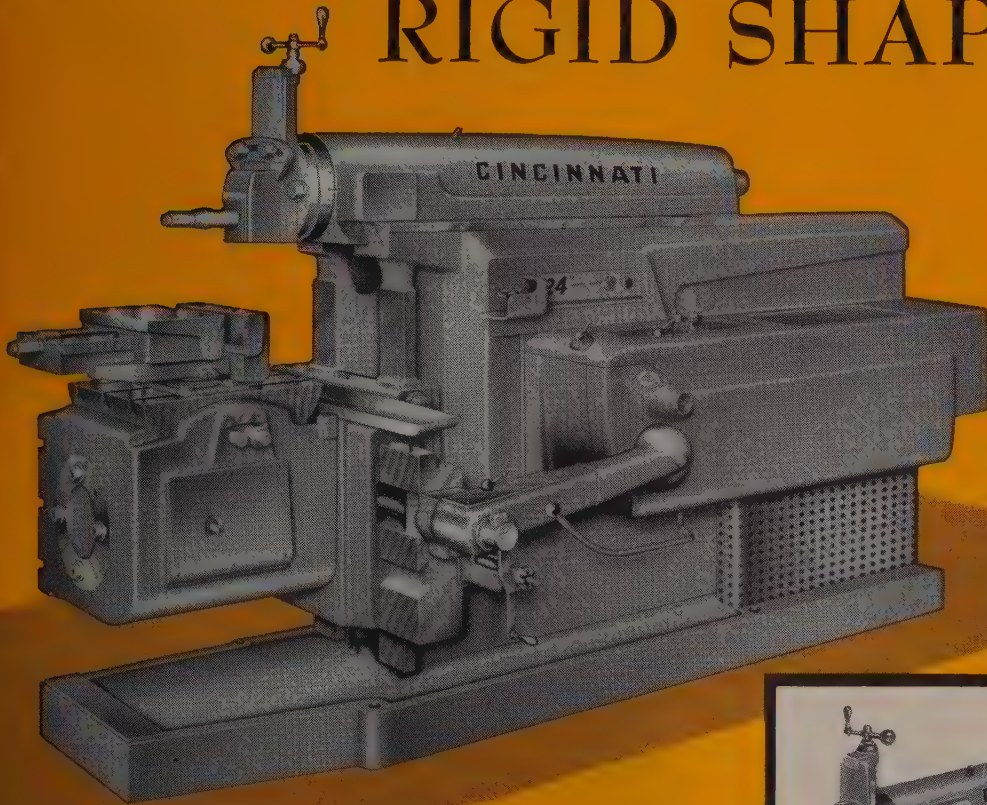
We believe we recently have seen advertisements in STEEL on Toncon iron. We have a customer interested in this material. It will be appreciated if you would tell us the manufacturer. We are told it has been purchased in sheet form.

F. D. Craver  
Babcock, Hinds & Underwood Inc.  
Binghamton, N. Y.

•The producer, Republic Steel Corp., has been withdrawing the product because of technological changes in the steel industry. It used to quote prices under the heading of hot-rolled ingot sheets and strip, but quit doing so in the last several months. See the article, "Another Victim of Progress" (May 30, page 110).



# CINCINNATI RIGID SHAPERS



Cincinnati Shapers, Shears and Press Brakes carry a 5 year guarantee on workmanship and material—write for details.

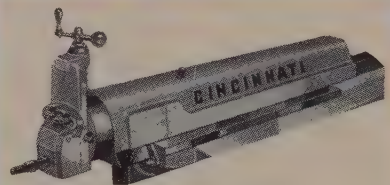
New—modern—these Rigid Shapers offer faster, more convenient controls, greater accuracy, greater dependability. The New nodular iron ram, trunnion and vise, and wide, heavily ribbed column give a new rigidity—increase accuracy in cutting.

The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

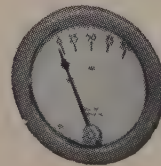
Write for the circular on the New Rigid Shapers.



Nodular iron, slot-free ram



Electro-magnetic Clutch and Brake



The only shaper with  
50 P.S.I. lubrication

## THE CINCINNATI SHAPER CO.

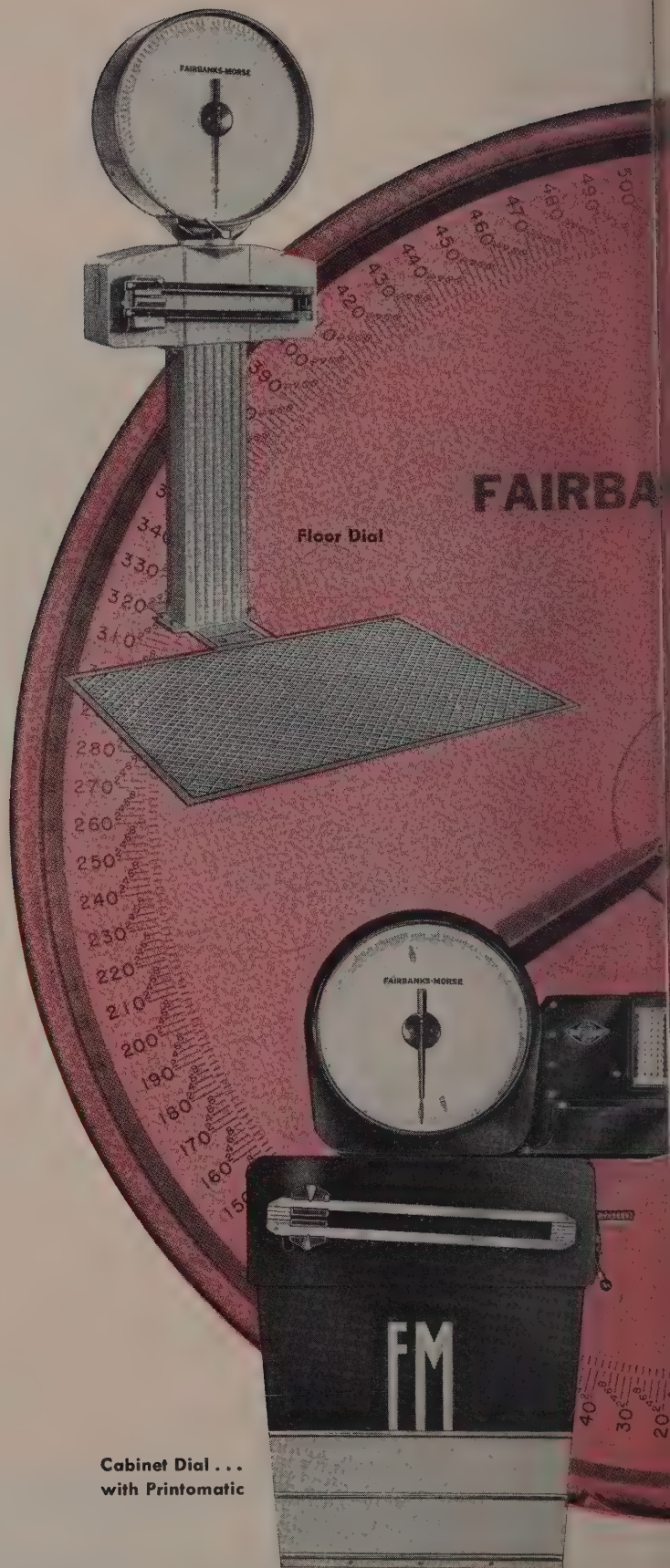
CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES





*announcing:*



**Cabinet Dial . . .  
with Printomatic**





# Fairbanks-Morse

## *floaxial* dial scales

**EASY TO READ...**

**EASY TO USE...**

**LASTINGLY ACCURATE**

Everything you've ever wanted in a dial scale, you'll find in the completely new... completely different Fairbanks-Morse line!

Fairbanks-Morse engineers designed the new line with your needs in mind... based on exhaustive field reports. They're streamlined... easy to read... easy to use... rugged to resist shock loads and rough handling... easy to service and maintain. And, above all, they have the new, patented *Floaxial* dial mechanism that assures enduring accuracy. There are no knife edges or pinpoint pivots to wear and affect long-life accurate weighing.

Dial chart and indicator are designed for easiest reading—ever! There's nothing to distract the eye... you get faster, easier weight indication... less chance for reading errors. Dial head swivels a full 360 degrees for easy reading at any angle!

For the complete, time-saving, cost-saving story on the new Fairbanks-Morse Dial line, see your Fairbanks-Morse Weighing Expert or write direct, on your letterhead, for new, colorful, descriptive bulletin on the type of *Floaxial* dial you want. Address Fairbanks, Morse & Co., Dept. ST-1, 600 S. Michigan Ave., Chicago 5, Ill.

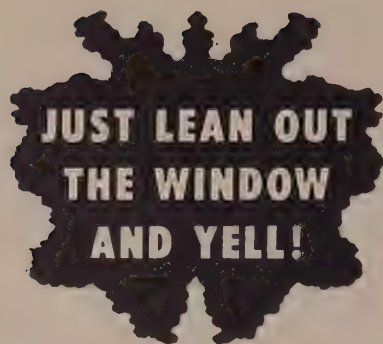


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a name worth remembering when you want the best

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS





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## "THE WHOLE BALL OF WAX"

Complete Steel Forging Facilities from  
Melt to Finished Product for Heavy  
Press Forgings of Intricate Shape . . . . . Write

*Cameron*

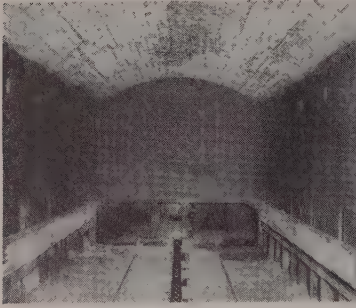
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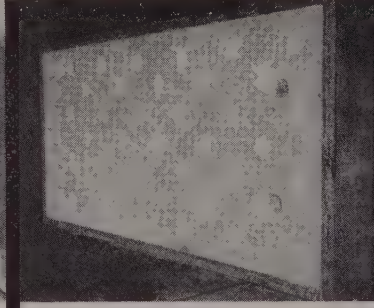
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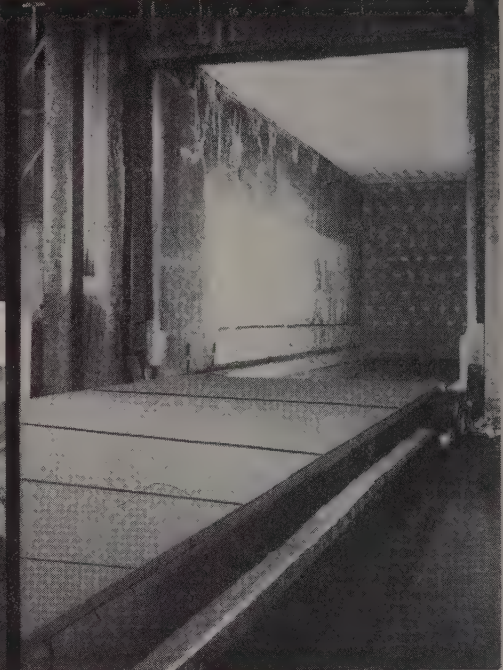
# Profitable trends in the use of refractories



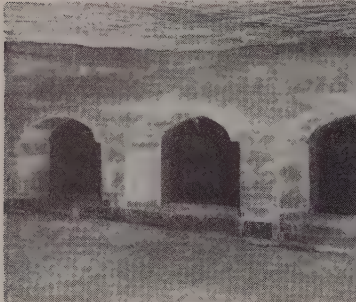
Car-type forge furnace with  
Laclede castable refractory walls



Soaking pit cover made with  
Laclede Plastic refractory



Car-type furnace lined with  
Laclede Castable and Plastic Refractories



Batch-type reheating furnace  
lined with Laclede Castable



Walking beam furnace with  
Laclede Plastic side and end walls

## Time and cost savings explain increasing use of LACLEDE Castable and Plastic Refractories

Increasingly successful and profitable uses of castable and plastic refractories are changing refractory practices in many mills and plants. Experience shows that when castables and plastics are properly selected and installed, time and cost savings may amount to 300% or more. Results plus ease and speed of installation contribute to these savings.

Correct selection of castables and plastics is simplified by the availability of a complete range of Laclede-Christy products. Laclede-Christy produces castables and plastics to meet every condition.

Laclede offers refractories for high or moderate temperature service, and to meet specific insulating property requirements. Specific qualifications such as refractoriness, strength, thermal conductivity, abrasion-resistance and erosion resistance are met in varying degrees, according to the castable or plastic recommended and selected.

Undoubtedly you can use Laclede-Christy Castables and Plastic Refractories to profitable advantage. What's your situation? What more would you like to know? Your nearby Laclede-Christy representative will be glad to give you specific information.

### Laclede-Christy Castable and Plastic Refractories

**Castables for high temperature service** to 2400° F and higher: Steelcast, Firmcast, Super Castable, Gun Cast and 3000° Castable.

**Castables for insulating properties** and service temperature to 2400° F: Porelite, Porelite 50, Porelite VL.

**Pitco Plastic** — for high temperature service (3150° F), where metal oxide penetration is severe.

**Super-Set Plastic** — for high temperature service (3150° F), where air dried bond is a factor, and where heat cannot be applied shortly after ramming.



## LACLEDE-CHRISTY COMPANY DIVISION

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# INERTIA

... can cost you money if you still specify bulky cast or forged circular parts. Here's how you can save three ways.

## Cut costs three ways with circular parts from Cleve-Weld

- 1 Cut your waste costs up to 30% over bulky cast or forged parts.
- 2 Reduce finished machining time to a minimum.
- 3 Speed your overall production.

From simple gear blanks to special alloy jet rings, the Cleve-Weld Process gives the same results—better performance and reduced costs. *Often the savings in machine time and material waste alone pay for the finished Cleve-Weld part.*

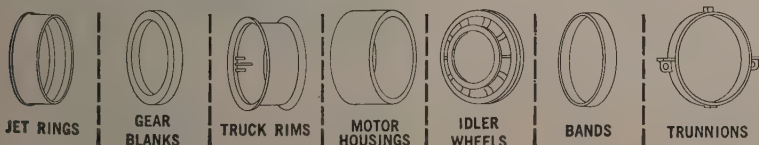
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Another  Product

**CLEVE-WELD PROCESS**  
RIMS • RINGS • WELDMENTS.

**THE CLEVELAND WELDING COMPANY**  
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SUBSIDIARY OF AMERICAN MACHINE & FOUNDRY COMPANY

### EXAMPLES OF CLEVE-WELD PROCESS PRODUCTS



JET RINGS

GEAR  
BLANKS

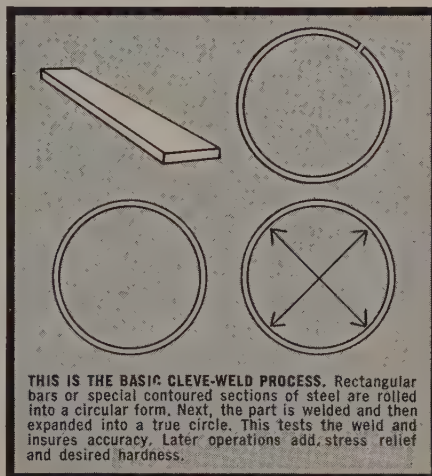
TRUCK RIMS

MOTOR  
HOUSINGS

IDLER  
WHEELS

BANDS

TRUNNIONS



### SEND THIS COUPON NOW

The Cleveland Welding Company  
West 117th Street and Berea Road, Cleveland 7, Ohio

Please send me your Cleve-Weld Process Brochure.

NAME

TITLE

ATTACH TO YOUR COMPANY LETTERHEAD AND MAIL.



# Do you save money when you by-pass your distributor?

Offhand . . . you might say you save money when you buy direct from manufacturers.

Experienced purchasing men would tell you that this kind of "bargain" is heavily booby-trapped, that low prices at the expense of your local distributor are often very costly to the buyer.

Sure, it's great at first . . . buying major items direct from the maker. But direct buying has a way of snowballing . . . the buyer finds himself in a widening spiral that includes the direct buying of more and more items . . . and then they're anything but bargains. For the savings effected by direct buying are more than swallowed up by extra man-hours needed to handle the volume of paper work it entails, to say nothing of extra shipping costs and warehousing expenses. Add to that the loss of the competent on-the-spot advisory service your local distributor gives you, and you'll agree that it would take far more than the modest saving you'd realize to com-

pensate for the total cost of such purchasing.

We are convinced that it is advantageous to *both* the buyer and seller to have products go through a distributor. By minimizing the manufacturer's sales and distribution costs, by providing a "department-store for industry" to supply *all* purchasers, by giving services that only a local organization can provide efficiently, we are convinced that today's distribution pattern—from maker to local distributor to user—is the most effective and economical it is possible to devise.



3594

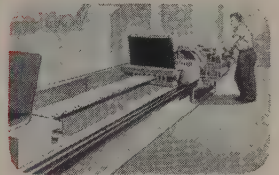
A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION



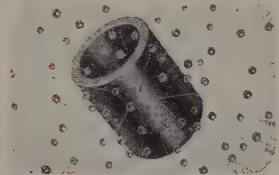
# In roller chain ... **EXTRAS\*** like these give you extra reliability



**LOCK-TYPE BUSHINGS** (applied on a range of sizes) end a cause of stiff chain



**PRE-STRESSING** of multiple width chain provides uniform load distribution.



**SHOT-PEENED ROLLERS** have greater fatigue life, added ability to withstand impact.



**CLOSER HEAT-TREAT CONTROL** — coupled with rigid testing insures uniformity.

**\*And you pay no premium for these LINK-BELT extras**

**B**IG reason why Link-Belt Precision Steel Roller Chain is first choice for so many tough jobs is that it has *extra reliability built-in*. For example, pre-stressing smooths out any irregularities of multiple width chain *in advance*. And it's just one of many *extras* you get as *standard* from Link-Belt. Check the three others shown here. Then call the Link-Belt office or authorized stock carrying distributor near you for facts on Link-Belt's complete range of roller chain and sprockets. Data Book 2457 gives full information on single and multiple widths, in  $\frac{1}{4}$ " to 3" pitch, 1" to 3" double pitch. Ask for your copy.

**LINK-BELT**

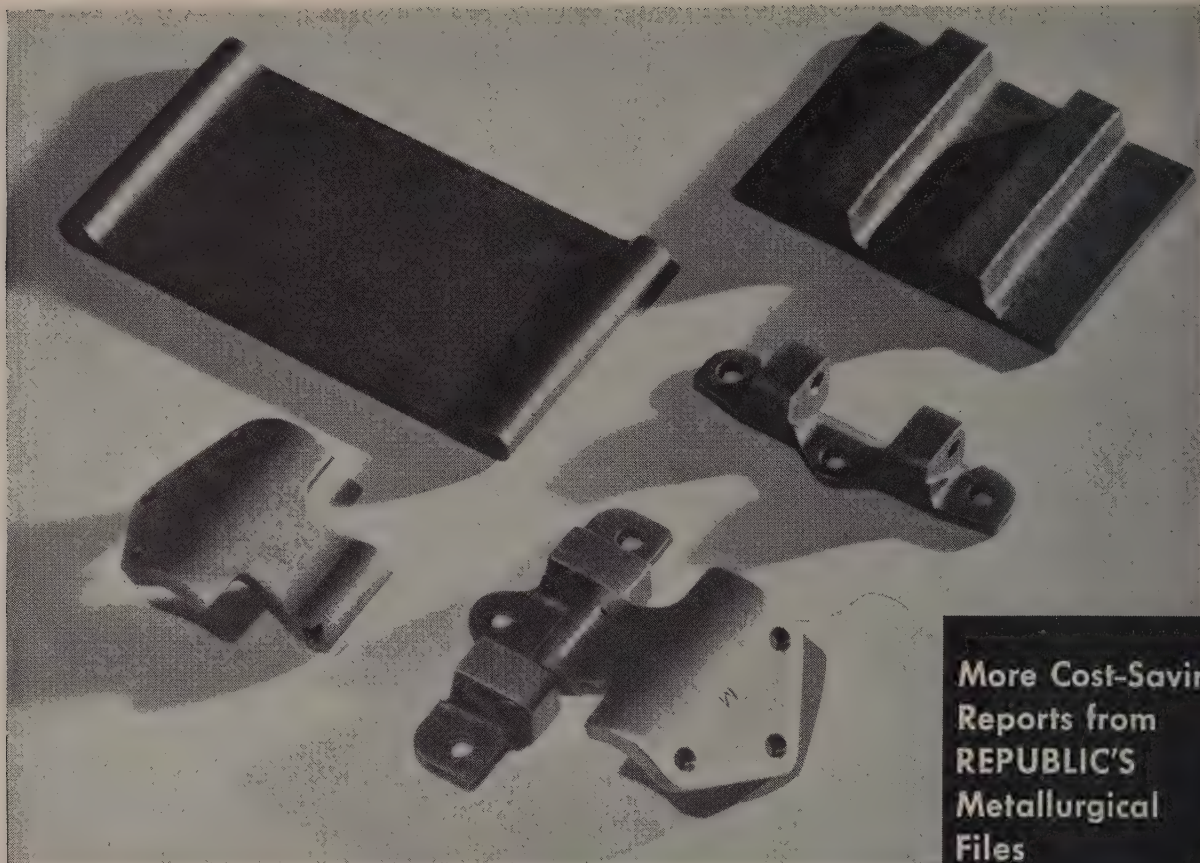


**ROLLER CHAIN & SPROCKETS**

13,702

**LINK-BELT COMPANY:** Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Austria, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.





More Cost-Saving  
Reports from  
**REPUBLIC'S**  
Metallurgical  
Files

...the right metal in the right place

## CUTS MACHINING COST FOR HINGE MANUFACTURER

These automobile door hinges are produced at less cost because much of the machining has been eliminated. They are made from Republic Hot Rolled Carbon Special Sections preformed to the predominating cross section of the component parts of the hinge. Parts are cold formed by broaching. Drilling and tapping are the only other machining operations necessary.

You can save money, too, when your steel parts can be made from Republic Special Sections. Large tonnage requirements are not necessary, but they do result in greater economies. We can produce cold drawn special sections in carbon, alloy, and stainless steels, in large or small quantities, to meet your re-

quirements. Possibilities for variation in contour are almost limitless. Republic also supplies heavy tonnages of hot rolled sections in the same various steels.

Selection of the proper steels for each application requires many considerations—performance conditions, length of service, cost, processing methods, to name a few.

A Republic representative will be happy to call at your plant and discuss the possibilities of applying Republic Special Sections to your parts. He will tell you promptly and impartially whether the nature of your parts would make the use of special sections efficient and economical. There is no cost or obligation. Mail the coupon for prompt action.

# REPUBLIC



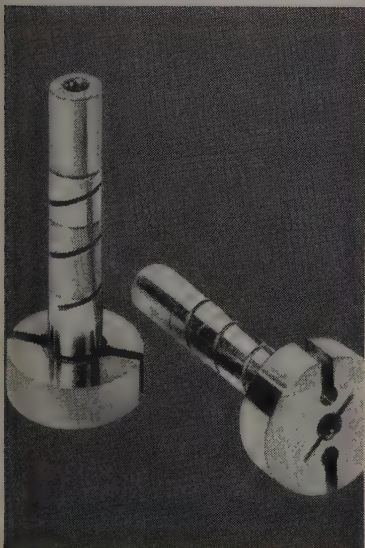
*World's Widest Range of Standard Steels*



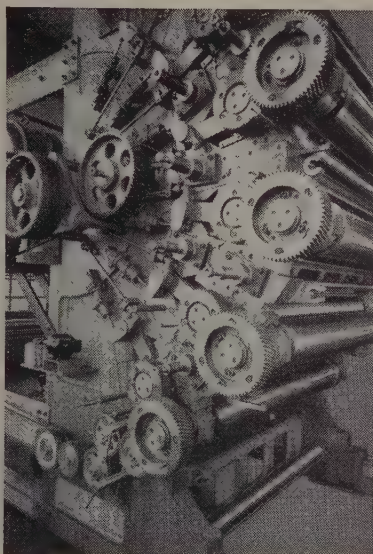
**Republic Alloy Metallurgists help  
refrigerator manufacturer  
cut scrap losses 25%**



Here are the results of a switch to Republic Cold Drawn Alloy Steels in making this refrigerator compressor rotor—scrap losses cut from 25% to 0.1%, several high-cost finish-grindings eliminated, an every-piece hardness check reduced to a simple spot check, distortion trouble eliminated. Republic Metallurgists, Field, Laboratory and Mill worked closely with the manufacturer's engineers in selecting the right alloy steel with the required structure for proper hardenability, machinability and surface finish. What about your product or process? This 3-Dimensional Metallurgical Service is available to all alloy steel users without obligation. Check coupon if you would like a Republic Field Metallurgist to call.



**Republic Pig Iron Metallurgist  
helps press manufacturer  
obtain superior finish and top  
machinability on cast parts**



This company's requirements for cast parts are strict. They call for fine surface finish, wear-resistance, high strength and top machinability. To find a pig iron to meet these requirements a Republic Pig Iron Metallurgist was consulted. He recommended Chateaugay, Republic's exclusive premium pig iron. His recommendation was impartial because Republic is the only producer of all five grades of merchant pig iron. Chateaugay assures this company of fine grain structure throughout every casting. It cools evenly, fills adjoining light and heavy sections completely. Castings machine beautifully and economically. A Republic Pig Iron Metallurgist will be glad to show you how Chateaugay consistently outperforms other pig irons.

**Republic Machining Specialist  
helps customer increase  
production 18%**



This automotive transmission parts manufacturer was having difficulty holding finish below 100 micro-inches. Part specifications called for a 40 to 60 micro-inch finish on a two-step internal bore, machined from Republic Cold Drawn B-1113 bar stock. A rush call went out for a Republic Machining Specialist. He looked over the job and designed a new broaching fixture and head to give a burnished finish under 10 micro-inches. The result: parts are superior to specifications; machine efficiency greatly increased; production up about 18%. What about you? Need help on machining or change-over problems? Republic Machining Specialists are ready with prompt solutions. Let us know when you would like one to call.



# STEEL

*and Steel Products*

**REPUBLIC STEEL CORPORATION**

**3120 East 45th Street, Cleveland 27, Ohio**

I would like more information on Republic Special Sections.

☐ Hot Rolled ☐ Cold Drawn ☐ Have a representative call

I am interested in the services of a Republic

☐ Alloy Metallurgist ☐ Pig Iron Metallurgist

☐ Machining Specialist

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

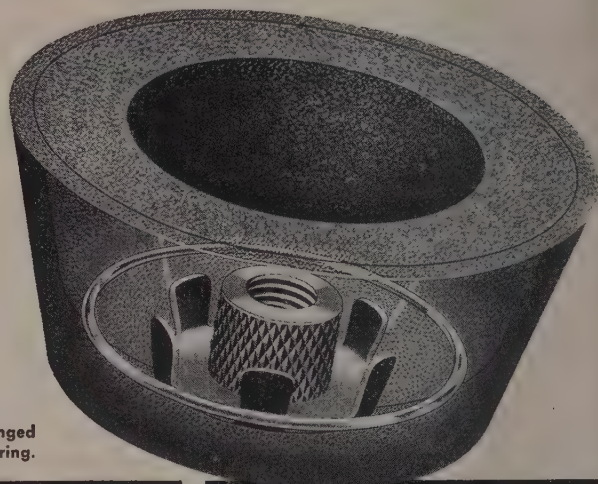
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K-9021



Today's new lightweight portable grinders need this kind of wheel!

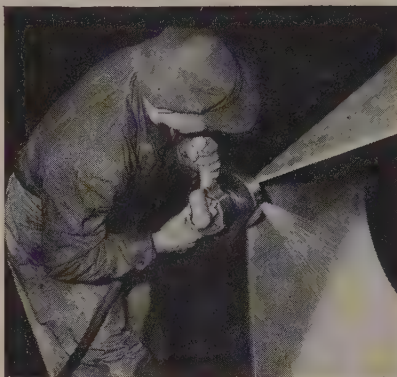
The new lightweight  
**U.S. ROYALITE**  
**HARD SHELL**  
**CUP WHEEL**



"X-ray" view of wheel shows pronged anchor bushing and safety ring.



Here a worker uses a lightweight grinder with a U. S. Royalite Hard Shell Cup Wheel, to remove weld butt and to clean up welded structural steel member.



Removing weld flash from fabricated steel component for atomic reactor. Careful dressing of weld flash was required to obtain smooth surface for joining with other components.



Contour grinding (to template) for smooth surface joint between components for atomic reactor. Component is of fabricated steel.

*This great wheel is powerfully reinforced by a pronged anchor bushing and safety ring assuring a safer and smoother-running cup.*

The U. S. Royalite® Wheel is "job-gearred" for these modern lightweight portable grinders. Royalite's free cutting face has a tougher rim, which keeps the edge sharp for the full life of the wheel.

**EXTRA DIVIDEND:** Remember that when you buy wheels from a United States Rubber Com-

pany salesman you are dealing *direct* and are being served by a specialist—a man whose only job is selling and *servicing* abrasive wheels. He will see that you get maximum value out of your abrasive wheel dollars.

• • •

The combination of the *lightweight* grinder and the *safer, smooth-running* U. S. Royalite Wheel means a better job in less time—with less worker fatigue.



Mechanical Goods Division

**United States Rubber**



## CALENDAR OF MEETINGS

Jan. 18-19, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Secretary: Harry P. Dolan.

Jan. 18-19, Steel Shipping Containers Institute Inc.: Winter meeting, Hampshire House, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 18-21, National Tool & Die Manufacturers Association: Annual winter meeting, Empress hotel, Miami Beach, Fla. Association's address: 907 Public Square Bldg., Cleveland 14, O. Executive secretary: George S. Eaton.

Jan. 19-20, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association's address: 79 W. Monroe St., Chicago 3, Ill. Secretary: J. Dwight Evans.

Jan. 20, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 15, O. Secretary: Lowell D. Ryan.

Jan. 23-24, Industrial Heating Equipment Association: Annual meeting, LaSalle hotel, Chicago. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Carl L. Ipsen.

Jan. 23-25, Truck-Trailer Manufacturers Association Inc.: Annual meeting, Edgewater Gulf hotel, Edgewater Park, Miss. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John Hulse.

Jan. 23-26, Plant Maintenance & Engineering Show: Convention Hall, Philadelphia. Information: Clapp & Pollak Inc., 841 Madison Ave., New York 17, N. Y.

Jan. 24, Cutting Tool Manufacturers Association: Annual meeting, Detroit Yacht Club, Detroit. Association's address: 416 Penobscot Bldg., Detroit 26, Mich. Executive secretary: Martin J. Ewald.

Jan. 24-27, American Management Association: General management conference, Fairmont hotel, San Francisco. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Jan. 26-27, Blast Furnace & Coke Association of the Chicago District: Winter meeting, Del Prado hotel, Chicago. Information: C. W. Bruce, chief engineer, Republic Steel Corp., 11600 S. Burley Ave., Chicago 17, Ill.

Jan. 28-Feb. 4, Industrial Diamond Association of America Inc.: Annual meeting, Hollywood Beach hotel, Hollywood Beach, Fla. Association's address: Box 175, Pompton Plains, N. J. Executive manager: Athos D. Leveridge.

Jan. 29-Feb. 2, Associated Equipment Distributors: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Association's address: 30 E. Cedar St., Chicago, Ill. Executive secretary: P. D. Hermann.

Jan. 30-Feb. 3, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Feb. 1-2, Midwest Welding Conference: Armour Research Foundation, Illinois Institute of Technology, Chicago. Information: Harry Schwartzbart, Armour Research Foundation, 35 W. 33rd St., Chicago 16, Ill.

Feb. 6-8, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Feb. 9-10, Steel Kitchen Cabinet Manufacturers Association, Spring meeting, Waldorf-Astoria, New York. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

Feb. 13-17, American Society of Civil Engineers: Winter meeting, Baker hotel, Dallas, Tex. Society's address: 33 W. 39th St., New York, N. Y. Secretary: William N. Wisely.

# "Standard"

Serves Manufacturers Who Use  
All Shapes and Sizes of  
MECHANICAL STEEL TUBING

## SIZE AND THICKNESS CHART of Electric Weld Tubing for Mechanical Use

TUBE DIAMETER "O.D. SIZE	MAXIMUM WALL		MINIMUM WALL	
	DECIMAL	B. W. GAUGE	DECIMAL	B. W. GAUGE
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.083"	14	.028"	22
1"	.109"	12	.028"	22
1-1/8"	.109"	12	.028"	22
1-1/4"	.134"	10	.028"	22
1-3/8"	.134"	10	.028"	22
1-1/2"	.148"	9	.035"	20
1-5/8"	.148"	9	.035"	20
1-3/4"	.165"	8	.035"	20
1-7/8"	.165"	8	.035"	20
2"	.180"	7	.035"	20
2-1/4"	.203"	6	.035"	20
2-1/2"	.203"	6	.035"	20
2-3/4"	.238"	5	.049"	18
3"	.238"	4	.049"	18
3-1/4"	.238"	4	.049"	18
3-1/2"	.250"	3	.065"	16
3-3/4"	.250"	3	.065"	16
3-7/8"	.250"	3	.065"	16
4"	.250"	3	.065"	16
4-1/4"	.250"	3	.065"	16
4-1/2"	.250"	3	.065"	16
4-3/4"	.250"	3	.065"	16
5"	.250"	3	.065"	16
5-1/2"	.250"	3	.065"	16
6"	.250"	3	.065"	16
6-1/2"	.250"	3	.065"	16
7"	.250"	3	.065"	16
7-1/2"	.250"	3	.065"	16
8"	.250"	3	.065"	16
8-1/2"	.250"	3	.065"	16
9"	.250"	3	.065"	16
9-1/2"	.250"	3	.065"	16
10"	.250"	3	.065"	16
10-1/2"	.250"	3	.065"	16
11"	.250"	3	.065"	16
11-1/2"	.250"	3	.065"	16
12"	.250"	3	.065"	16
12-1/2"	.250"	3	.065"	16
13"	.250"	3	.065"	16
13-1/2"	.250"	3	.065"	16
14"	.250"	3	.065"	16
14-1/2"	.250"	3	.065"	16
15"	.250"	3	.065"	16
15-1/2"	.250"	3	.065"	16
16"	.250"	3	.065"	16
16-1/2"	.250"	3	.065"	16
17"	.250"	3	.065"	16
17-1/2"	.250"	3	.065"	16
18"	.250"	3	.065"	16
18-1/2"	.250"	3	.065"	16
19"	.250"	3	.065"	16
19-1/2"	.250"	3	.065"	16
20"	.250"	3	.065"	16
20-1/2"	.250"	3	.065"	16
21"	.250"	3	.065"	16
21-1/2"	.250"	3	.065"	16
22"	.250"	3	.065"	16
22-1/2"	.250"	3	.065"	16
23"	.250"	3	.065"	16
23-1/2"	.250"	3	.065"	16
24"	.250"	3	.065"	16
24-1/2"	.250"	3	.065"	16
25"	.250"	3	.065"	16
25-1/2"	.250"	3	.065"	16
26"	.250"	3	.065"	16
26-1/2"	.250"	3	.065"	16
27"	.250"	3	.065"	16
27-1/2"	.250"	3	.065"	16
28"	.250"	3	.065"	16
28-1/2"	.250"	3	.065"	16
29"	.250"	3	.065"	16
29-1/2"	.250"	3	.065"	16
30"	.250"	3	.065"	16
30-1/2"	.250"	3	.065"	16
31"	.250"	3	.065"	16
31-1/2"	.250"	3	.065"	16
32"	.250"	3	.065"	16
32-1/2"	.250"	3	.065"	16
33"	.250"	3	.065"	16
33-1/2"	.250"	3	.065"	16
34"	.250"	3	.065"	16
34-1/2"	.250"	3	.065"	16
35"	.250"	3	.065"	16
35-1/2"	.250"	3	.065"	16
36"	.250"	3	.065"	16
36-1/2"	.250"	3	.065"	16
37"	.250"	3	.065"	16
37-1/2"	.250"	3	.065"	16
38"	.250"	3	.065"	16
38-1/2"	.250"	3	.065"	16
39"	.250"	3	.065"	16
39-1/2"	.250"	3	.065"	16
40"	.250"	3	.065"	16
40-1/2"	.250"	3	.065"	16
41"	.250"	3	.065"	16
41-1/2"	.250"	3	.065"	16
42"	.250"	3	.065"	16
42-1/2"	.250"	3	.065"	16
43"	.250"	3	.065"	16
43-1/2"	.250"	3	.065"	16
44"	.250"	3	.065"	16
44-1/2"	.250"	3	.065"	16
45"	.250"	3	.065"	16
45-1/2"	.250"	3	.065"	16
46"	.250"	3	.065"	16
46-1/2"	.250"	3	.065"	16
47"	.250"	3	.065"	16
47-1/2"	.250"	3	.065"	16
48"	.250"	3	.065"	16
48-1/2"	.250"	3	.065"	16
49"	.250"	3	.065"	16
49-1/2"	.250"	3	.065"	16
50"	.250"	3	.065"	16
50-1/2"	.250"	3	.065"	16
51"	.250"	3	.065"	16
51-1/2"	.250"	3	.065"	16
52"	.250"	3	.065"	16
52-1/2"	.250"	3	.065"	16
53"	.250"	3	.065"	16
53-1/2"	.250"	3	.065"	16
54"	.250"	3	.065"	16
54-1/2"	.250"	3	.065"	16
55"	.250"	3	.065"	16
55-1/2"	.250"	3	.065"	16
56"	.250"	3	.065"	16
56-1/2"	.250"	3	.065"	16
57"	.250"	3	.065"	16
57-1/2"	.250"	3	.065"	16
58"	.250"	3	.065"	16
58-1/2"	.250"	3	.065"	16
59"	.250"	3	.065"	16
59-1/2"	.250"	3	.065"	16
60"	.250"	3	.065"	16
60-1/2"	.250"	3	.065"	16
61"	.250"	3	.065"	16
61-1/2"	.250"	3	.065"	16
62"	.250"	3	.065"	16
62-1/2"	.250"	3	.065"	16
63"	.250"	3	.065"	16
63-1/2"	.250"	3	.065"	16
64"	.250"	3	.065"	16
64-1/2"	.250"	3	.065"	16
65"	.250"	3	.065"	16
65-1/2"	.250"	3	.065"	16
66"	.250"	3	.065"	16
66-1/2"	.250"	3	.065"	16
67"	.250"	3	.065"	16
67-1/2"	.250"	3	.065"	16
68"	.250"	3	.065"	16
68-1/2"	.250"	3	.065"	16
69"	.250"	3	.065"	16
69-1/2"	.250"	3	.065"	16
70"	.250"	3	.065"	16
70-1/2"	.250"	3	.065"	16
71"	.250"	3	.065"	16
71-1/2"	.250"	3	.065"	16
72"	.250"	3	.065"	16
72-1/2"	.250"	3	.065"	16
73"	.250"	3	.065"	16
73-1/2"	.250"	3	.065"	16
74"	.250"	3	.065"	16
74-1/2"	.250"	3	.065"	16
75"	.250"	3	.065"	16
75-1/2"	.250"	3	.065"	16
76"	.250"	3	.065"	16
76-1/2"	.250"	3	.065"	16
77"	.250"	3	.065"	16
77-1/2"	.250"	3	.065"	16
78"	.250"	3	.065"	16
78-1/2"	.250"	3	.065"	16
79"	.250"	3	.065"	16
79-1/2"	.250"	3	.065"	16
80"	.250"	3	.065"	16
80-1/2"	.250"	3	.065"	16
81"	.250"	3	.065"	16
81-1/2"	.250"	3	.065"	16
82"	.250"	3	.065"	16
82-1/2"	.250"	3	.065"	16
83"	.250"	3	.065"	16
83-1/2"	.250"	3	.065"	16
84"	.250"	3	.065"	16
84-1/2"	.250"	3	.065"	16
85"	.250"	3	.065"	16
85-1/2"	.250"	3	.065"	16
86"	.250"	3	.065"	16
86-1/2"	.250"	3	.065"	16
87"	.250"	3	.065"	16
87-1/2"	.250"	3	.065"	16
88"	.250"	3	.065"	16
88-1/2"	.250"	3	.065"	16
89"	.250"	3	.065"	16
89-1/2"	.250"	3	.065"	16
90"	.250"	3	.065"	16
90-1/2"	.250"	3	.065"	16
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91-1/2"	.250"	3	.065"	16
92"	.250"	3	.065"	16
92-1/2"	.250"	3	.065"	16
93"	.250"	3	.065"	16
93-1/2"	.250"	3	.065"	16
94"	.250"	3	.065"	16
94-1/2"	.250"	3	.065"	16
95"	.250"	3	.065"	16
95-1/2"	.250"	3	.065"	16
96"	.250"	3	.065"	16
96-1/2"	.250"	3	.065"	16
97"	.250"	3	.065"	16
97-1/2"	.250"	3	.065"	16
98"	.250"	3	.065"	16
98-1/2"	.250"	3	.065"	16
99"	.250"	3	.065"	16
99-1/2"	.250"	3	.065"	16
100"	.250"	3	.065"	16

\*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.



Manufacturers requiring tubing for civilian or defense production prefer "Standard's" Electric Weld Steel Tubing for many reasons! "Standard's" Electric Weld is produced in one of the most versatile and complete mills of its kind in the world. "Standard's" 33 years of specialized tubing "know-

how", and monthly production of millions of feet of stainless and carbon steel tubing, in wide range of sizes and gauges, assure you of utmost satisfaction. No problem of tolerance, precision or severest application for mechanical, structural, or pressure tubing is too difficult.

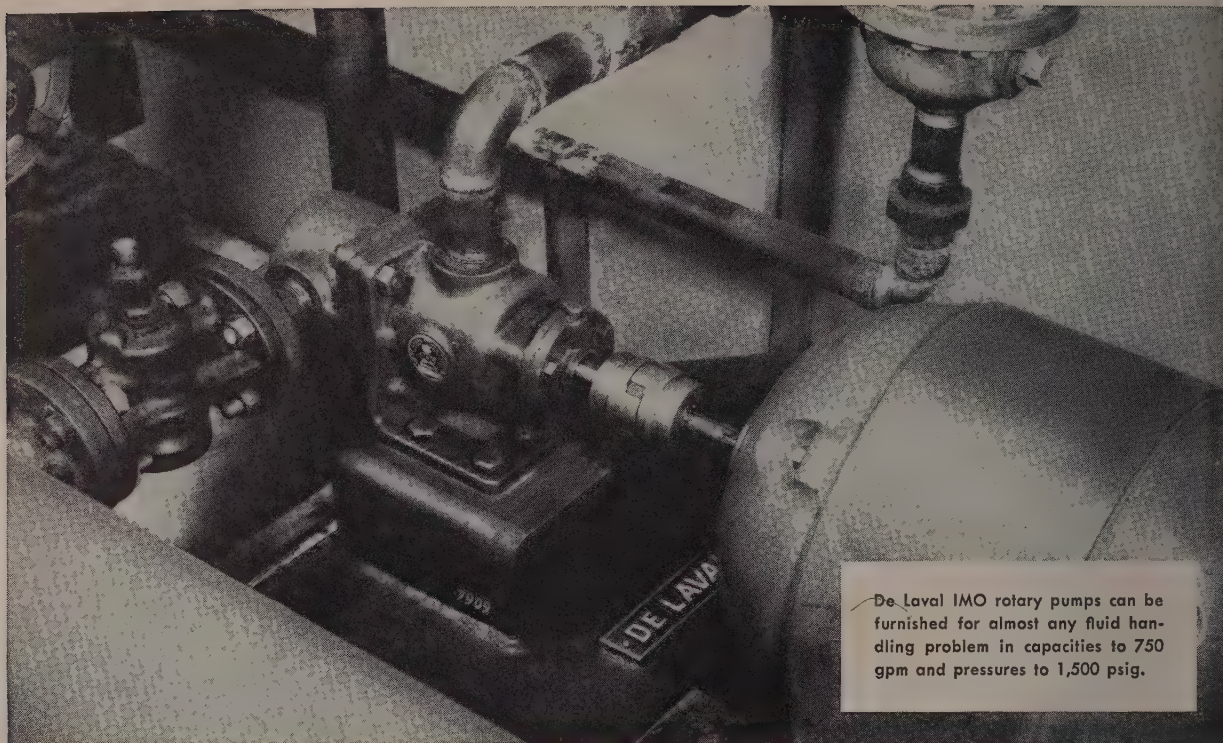
STAINLESS STEEL TUBING  
1/4" to 4 1/2" O.D. .020 to .154 wall

ABOVE CHART COVERS  
ROUND CARBON STEEL  
TUBING . . .

EQUIVALENT SQUARES,  
RECTANGULARS AND  
SPECIAL SHAPES ARE  
ALSO AVAILABLE.







De Laval IMO rotary pumps can be furnished for almost any fluid handling problem in capacities to 750 gpm and pressures to 1,500 psig.

## What to Look for in a Rotary Screw Type Pump

By W. J. MONCON, Assistant Chief Engineer

De Laval Steam Turbine Company

A sound knowledge of design, and how it affects performance, is the best insurance a buyer can have that he will get the pump he needs. This brief analysis of the IMO, a rotary three-screw pump manufactured by the De Laval Steam Turbine Company, will give you some of the necessary facts.

What qualities should you look for in a rotary type pump? It must, of course, meet specified capacities and pressures. But, it must also be efficient, operate quietly, stay on the job.

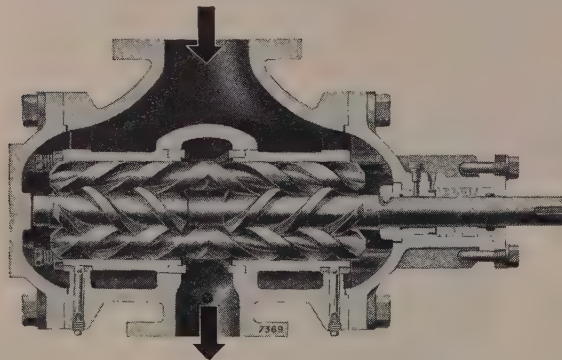
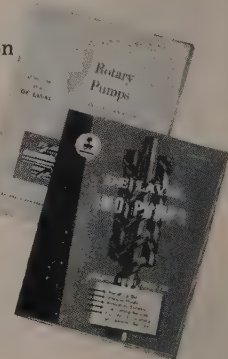
The axial flow of a screw type pump, and the resulting low inlet losses for any given pump speed, are important

benefits that should be considered in making pump selections. The absence of timing gears and other mechanical features of construction also enable the De Laval IMO pump to operate at direct-connected motor and turbine speeds . . . to handle viscous liquids and high suction lifts.

One of the most important features of the IMO pump is the hydraulic turning of the idler or sealing rotors. The central or power rotor is the pumping element; the liquid pumped turns the sealing rotors.

A screw type pump is well suited for applications where pulsation-free flow is desirable. The axial flow of the liquid without trapping and the unique thread form which keeps closures fluid-tight contribute to quiet operation of the IMO pump.

*Catalog LS* gives useful application and specification data on the IMO pump. An article titled, *Rotary Pumps, Basic Considerations in Their Application*, contains a description of rotary pumps in general. For these publications, write on your company letterhead to De Laval Steam Turbine Company, 860 Nottingham Way, Trenton 2, New Jersey. DL-301



De Laval IMO Series A322A, a positive displacement, rotary screw type pump, can handle capacities to 750 gpm and pressures to 150 psig.



# UNITED<sup>®</sup>

RENDLEMAN ROD MILL

HIGHER PRODUCTION RATE THAN  
ATTAINED ON ANY OTHER ROD MILL \*



*Designed and Built by*



## UNITED<sup>®</sup>

ENGINEERING AND FOUNDRY COMPANY  
PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN  
CANTON • WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO  
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls,  
Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery.  
Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

\*

- CONDITIONING OF BILLETS UNNECESSARY.
- FEWER ROLL CHANGES REQUIRED.
- LOWER ROLL and GUIDE MAINTENANCE COST.
- BETTER QUALITY RODS AT LOWER COST.

UNITED can serve you no matter where in the world you are.



*Experience proves*



## **EXTRA LOW-CARBON\* FERROCHROMIUM**

is an economical and efficient addition agent  
for a wide range of stainless steels

### **EXLO® OFFERS YOU...**

- high density
- exceptional cleanliness
- high chromium-carbon ratio
- high chromium content
- low silicon content

*Have a talk with your nearest Vancoram  
Representative for full particulars.*

\*Carbon content .025% max or .06% max — whichever best suits your requirements.

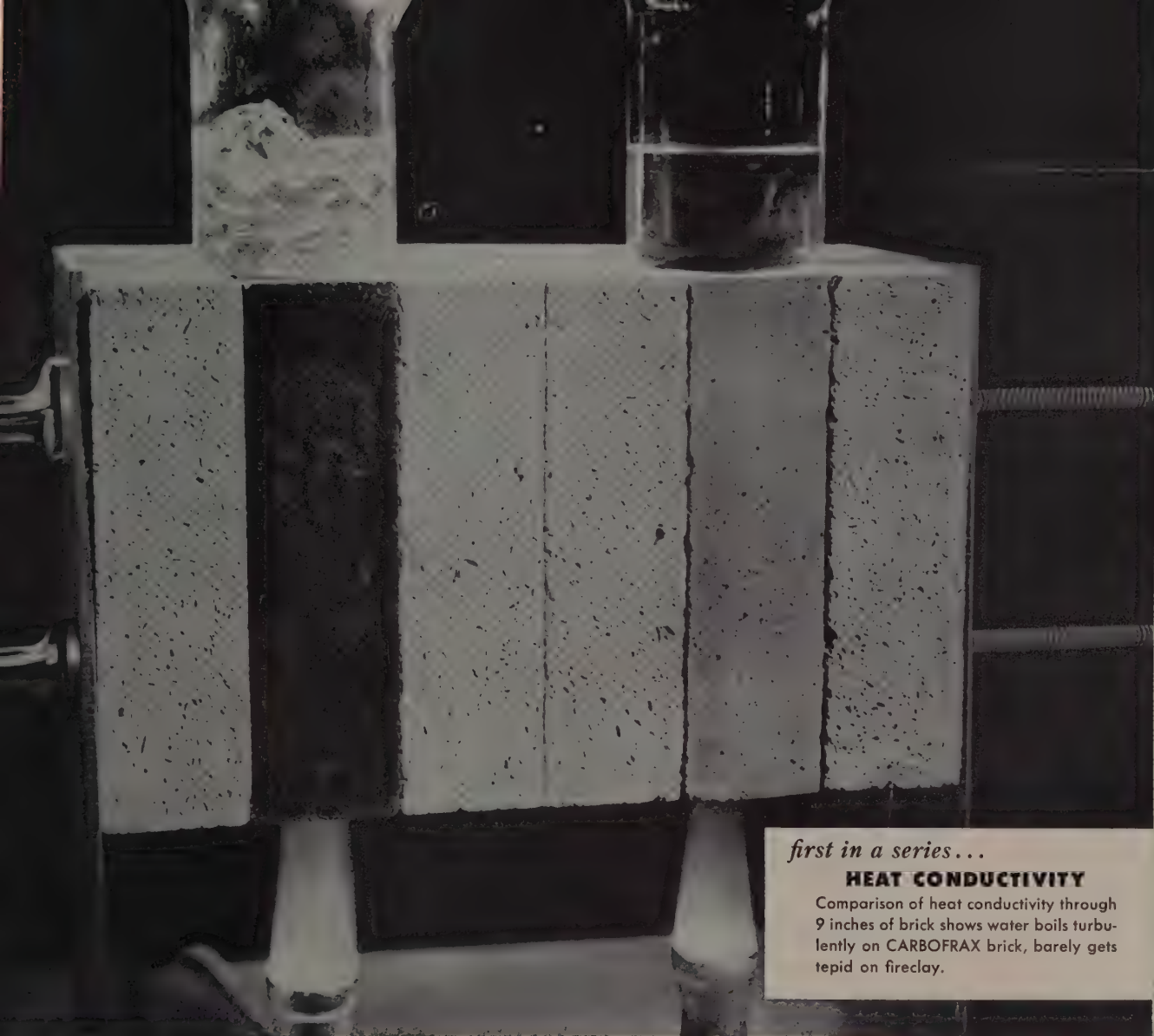
## **VANADIUM CORPORATION OF AMERICA**

420 Lexington Avenue, New York 17, N. Y.

DETROIT • CHICAGO • PITTSBURGH • CLEVELAND

*Producers of alloys, metals and chemicals*





*first in a series...*

#### **HEAT CONDUCTIVITY**

Comparison of heat conductivity through 9 inches of brick shows water boils turbulently on CARBOFRAX brick, barely gets tepid on fireclay.

## **Unusual Properties of Refractory Materials**

*High heat conductivity*—roughly 11 times that of fireclay and about 70% that of chrome-nickel steels—is one of the properties of CARBOFRAX® silicon carbide refractory brick. It is an ideal material for muffles, radiant tubes, retorts and similar structures where you need exceptional resistance to direct flame *plus* the ability to conduct heat efficiently. At 2200°F, thermal conductivity of CARBOFRAX brick is 109BTU/hr., sq. ft. and °F/in. of thickness.

CARBOFRAX refractories typify the many super refractories pioneered by Carborundum. Each has a wide range of properties. One, for example, is formed into precision parts that look like cast iron yet resist over 3000°F. Another, a new ceramic fiber, filters and insulates at temperatures no existing mineral or glass fiber can take.

Carborundum's new magazine "Refractories" pinpoints many practical applications for these unusual products. The forthcoming issue carries a feature article on "Heat Conductivity". Send for your copy today.

#### **VALUABLE INFORMATION FOR USERS OF:**

REFRATORIES • CASTABLE CEMENTS • POROUS PLATES AND TUBES

CATALYST SUPPORTS • OXIDE, BORIDE, NITRIDE AND CARBIDE

HIGH-TEMPERATURE MATERIALS • CERAMIC FIBER

*all in the new magazine "Refractories"*

**—MAIL THIS COUPON TODAY—**

**Dept. W16, Refractories Division  
The Carborundum Co., Perth Amboy, N. J.**

Please send me the forthcoming issue of "Refractories".

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# **CARBORUNDUM**

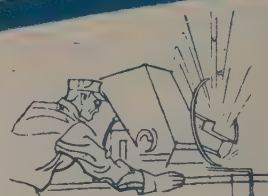




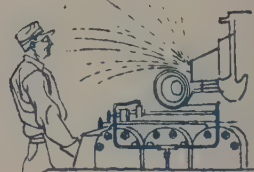
**From blueprint to welded component**

## Let American Welding handle the job!

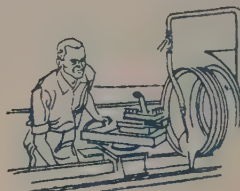
The next time design requires a circular weldment, or you think fabrication of a complicated weldment might be the best solution, give us a call. Our Industrial Products Division stands ready to assist manufacturers with problems involving fusion or resistance welding of all types of metals. In addition, we are actually a complete manufacturing plant with the "know-how," the manpower, and the facilities to handle the operations required to produce finished welded components of complex design or assembly. Send today for our new 24-page catalog describing American Welding facilities that are available. Let us demonstrate what American Welding can do for you.



**WELDING**



**FABRICATING**



**MACHINING**



**AMERICAN  
WELDING**

THE AMERICAN WELDING & MANUFACTURING CO.  
110 DIETZ ROAD • WARREN, OHIO



# Metalworking Outlook

## Fringes Are Higher

Fringe benefits cost greater Cleveland manufacturers an average of 38.54 cents per man-hour, up 8 cents or 25 per cent in the last two years. That's the finding of a survey by Associated Industries of Cleveland Inc., taking in 172 companies employing almost 77,000 hourly workers. Greatest increases came in companies employing 1000 or more. They are paying 39.62 cents per man-hour, up 9 cents from 1953. Companies having between 100 and 1000 workers are paying 5.7 cents more. Least change is registered in companies with under 100 hourly employees. They pay 35.64 cents now, compared with 32.20 in 1953. More than 30 different benefits are covered by the AIC survey. Most mentioned: Bonuses, vacations, pensions, insurance, rest periods and uniforms.

## Year for Home Improvement

If the U. S. Chamber of Commerce has its way, 1956 will be a record year for spending on home improvement. It estimates the potential outlays at more than \$20 billion—more than new homebuilding is likely to reach for some years. Estimates of improvement spending in 1954 and 1955 run around \$12 billion. The Chamber's Construction and Civic Development Department is spearheading a drive by builders, materials, finance and design men to persuade Mr. U. S. homeowner to buy the equivalent of a paint job and a refrigerator this year. It estimates that if each of our 48 million dwellings is improved \$580 worth, the potential would be more than realized.

## State Taxes Go Up

Taxpayers will contribute more to state revenues in 1956 than ever before, says Commerce Clearing House, Chicago. A record number of important upward revisions in state tax legislation were enacted in 1955. Five big targets: Income, sales, gasoline, cigarets and motor vehicles. During 1955, 14 states boosted three or more of these taxes. Significant changes: Oregon levied taxes on income earned in the state but not subject to regular corporation taxes; local governments of 17 states were authorized to enact new taxes.

## More Aid for Unemployed

Unemployment coverage will hit new peaks this year. James P. Mitchell, secretary of the Labor department, says 1.7 million more workers are covered now than in 1955. More than 40 million U. S. workers are protected. Improvements in compensation laws were made by 42 states and 3 territories in 1955. Maximum weekly benefits range from \$24 in Virginia to \$36 in New York and \$45 in Alaska. Maximums of \$30 or more are in effect for almost 70 per cent of all covered workers. The Labor de-



# Metalworking

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## Outlook

partment is working on a new set of standards to serve as a model for state legislative programs.

### Shortages Hurt

Cross Co., Detroit, says the shortage of hydraulic equipment and large precision bearings is coming close to threatening its machine tool shipments deadlines. Another machine tool builder sounds this warning: "Our shipments will be one-third better than in 1955, if we can get enough steel." The pinch extends through engineering help and skilled labor. Monarch Machine Tool Co., Sidney, O., is having to subcontract some grinding.

### Small Order Headache

Small orders still plague machinery and mill supply companies. Of some 235 members queried by the American Supply & Machinery Manufacturers' Association Inc., Cleveland, 175 say they have a small order problem. Most define a small order as one under \$25, though for some, it goes as high as \$100. Only 37 of the respondents say they refuse small orders. Repair parts are the big headache for many.

### Room for More Boom

How good is the market for plastics machinery? A. A. Hutchings, vice president sales, F. J. Stokes Machine Co., Philadelphia, says business was so good last year that he doubts if 1956 can equal it. He expects injection press sales to continue strong, but looks for some decline in thermo-setting presses. He may find part of his answer in a survey by the Society of the Plastics Industry Inc., New York. Of 232 respondents, 178 say they are planning to expand their production in the next six months.

### Bright Note on Autos

An encouraging slant on auto sales is afforded by last week's Chicago auto show. After three days, attendance hit 192,000, and the goal of 500,000 for the show seemed assured. Said one Ford sales manager: "Our men report 20 per cent more good prospects this year than last year at this time." During rush periods, Pontiac had up to 30 salesmen on the floor and took in names and addresses of 500 prospects. Official consensus of the \$10-million affair: New cars still draw a crowd, and there are plenty of buyers for the '56 models.

### Reynolds, Ford Join Forces

R. S. Reynolds Jr., president, Reynolds Metals Co., announced on Jan. 12 that Ford Motor Co. and his company signed a contract for the largest industrial aluminum order in the industry's history. The contract calls for delivery of more than 640 million lb of aluminum over the next ten years, and is renewable at Ford's option. It's planned to deliver the molten metal direct from a new Reynolds reduction plant at Listerhill, Ala., to a new Ford foundry which will be built next to it. Reynolds' facilities will cost from \$75 million to \$80 million. Power will be supplied by TVA.



# New Westinghouse Purchasing Plan

**Helpful to both buyer and seller**

The Purchasing Department of Westinghouse Electric Corporation has initiated a new purchasing program. Through a plan called Operation Co-operation they are developing an open door policy to encourage suppliers to meet with their engineers and others in an effort to learn more about Westinghouse products and methods.

In this way it is expected that suppliers' sales representatives and engineers may be in a better position to help. By giving suppliers every encouragement to ask questions, study shop operations, products, processes, etc., Westinghouse believes its own profits can be increased.

We congratulate the Westinghouse Purchasing Department on this progressive step and are convinced that it will not only build goodwill but will also prove practical and profitable for their good company. It is realized, of course, that many other companies operate along similar lines but this

formalizing of the program by a leading purchasing department is of interest and presents a strong challenge to all suppliers to make good on every contact.

We are glad to report that our own Purchasing Department is taking a page from the Westinghouse book and is following very much the same procedure. We are also glad to report that it has always been the Ryerson policy to have our representatives go through years of training within our own organization before going into the field, so that they are well qualified on all steel products and problems.

So, again we congratulate the Westinghouse Purchasing Department and others who have similar programs because we are confident that manufacturing costs will be reduced, products improved and buying and selling costs cut. In total, we believe that our American economy will benefit by "Operation Co-operation".

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## DETROIT STEEL CORPORATION

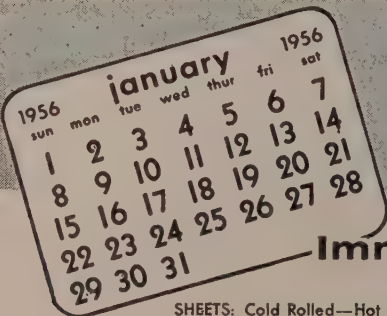
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January 16, 1956

## Scrap, Too High?

The sensation of the Institute of Scrap Iron & Steel's national convention in Chicago a few days ago was news that top grade heavy melting steel had broken into new high ground in the Youngstown district. Sales hit \$62 a gross ton.

After the convention, 1200 brokers and dealers scurried home with this question on their minds: Where's the market headed?

That question was equally important to steel plants and foundries keeping a wary eye on rising costs and to the hundreds of industrial plants interested in getting top dollar for their by-product.

In 1955, the scrap industry had its best year. It generated almost 39 million tons of material, of which 11.5 million tons came from industry, 6.5 million from old autos, 4.5 million from the railroads, 3 million from the farms and 13.25 million from miscellaneous sources. It shipped 34.5 million to steel mills and foundries. The remainder went to Canada, Japan and friendly countries in Europe.

This year, the industry feels there's a chance of beating its record. This optimism is predicated upon three factors: The steel industry matching its 1955 production of 117 million tons; the foundries increasing production 5 per cent to 15 million tons; and the continuance of exports to nations in the western orbit.

The perennially uncertain element in scrap is its price. Scrap is subject to the same whims and fancies as the stock market, with a few added embellishments. It's affected by the state of business, inventories, the weather and whether consumers are in a buying mood.

Fundamentally, the scrap man has no love for high scrap prices. They tie up too much of his capital. They subject him to an inventory loss if the market drops. They mean covering contracts at a loss in a rising market.

Everyone knows that two automatic price stabilizers are always in the background: Higher prices bring more dormant scrap out of hiding, and consumers can lean more heavily on pig iron.

What are the economic facts of life today?

At \$53.33, STEEL's scrap composite (Pittsburgh, Chicago and Philadelphia) is up 175 per cent from January, 1941.

Pig iron, at \$59 a gross ton, is up 150 per cent. So is nonbessemer iron ore at \$10.95. STEEL's finished steel composite, at \$128 a net ton, is up 125 per cent.

The conclusion is self-evident. A fair price on scrap is to the mutual benefit of both the dealer and the user.

*Edwin H. Such*  
EDITOR



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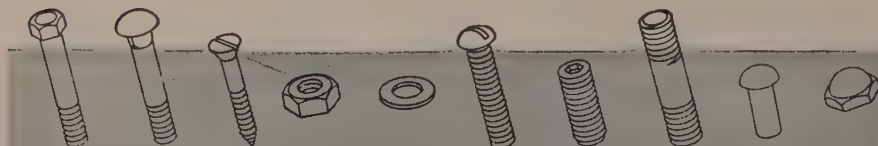
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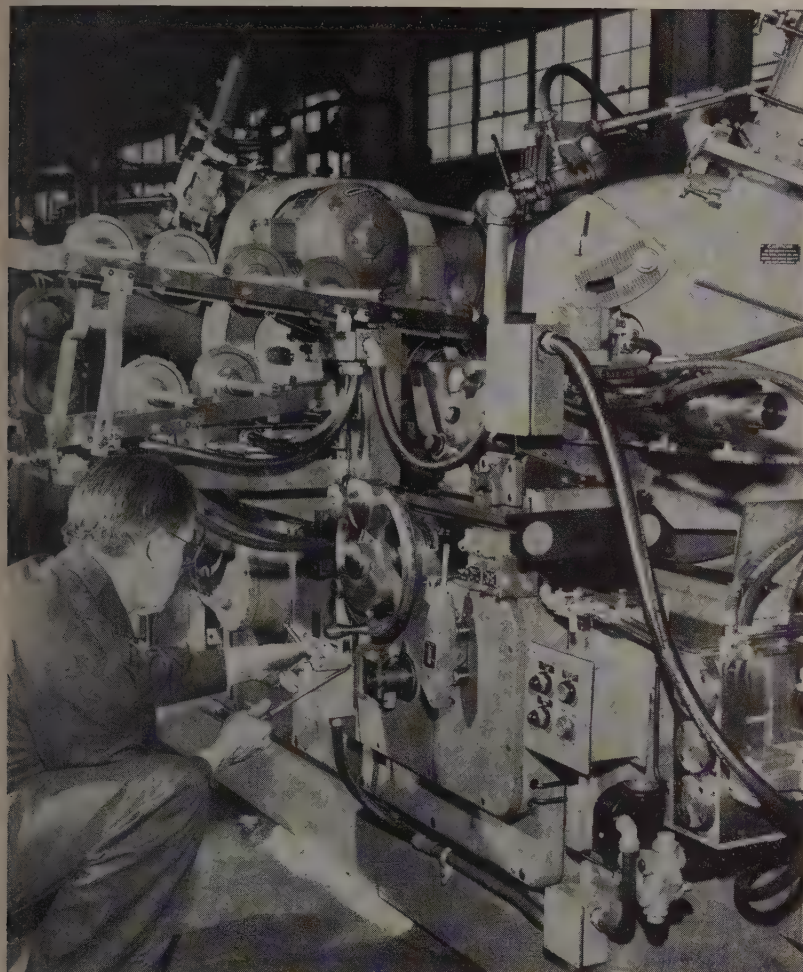


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Norton Co.

As new machine tool orders keep flooding in . . .

## Builders Up Their Sights

SIX months ago, if you had told a machine tool builder his industry would ring up \$1 billion in new orders in 1956, he might have laughed you out of his office. Now, optimism is so high that some reports from top industry sources point to a \$1-billion shipment year.

Through the first nine months of 1955, new orders were coming at an average of \$64 million a month. But in October and November, they shot above the \$100-million mark. Though December results still aren't complete, it's a safe bet they'll be just as good. And a spot check shows industry-

men believe the level will hold through June.

**Shipments Follow** — Predictions of shipments are closely related to new order levels. Builders are straining to hold down their order backlogs to avoid cancellations. Monarch Machine Tool Co., Sidney, O., is typical. It's working two shifts. Employment is up to over 1100 from 650 at the beginning of last year, and its order backlog has more than doubled.

Gisholt Machine Co., Madison, Wis., predicts its shipments will be up 50 per cent this year over 1955's. Other builders say 30 per

cent, 40 per cent, 33 per cent. Lowest estimate is 10 to 15 per cent, and the average, 35 per cent. Projected for the industry, this puts shipments at the \$900-million level for the year. At least that much will have to be shipped to hold down order backlogs.

**Boosters**—One reason for the upswing has been the machine tool show—1955 was the first new model year for the industry since 1947. Developing new models and regearing production lines were not painless. Many builders went into the red. "Due to expenses incurred in introducing new models," is seen in many an annual report. Now headaches are turning to smiles. Builders hope to cash in on the show for some years to come.

Automotive retooling for '57 models will play a big part in first-half shipments. Many contracts are still to be let. Complete redesign of its product will cost Detroit about \$1 billion for facilities, engineering and tools. Machine tool needs will be up far above the level of the average face-lift year.

**Defense**—About the time auto needs start to taper off, shipments to the Air Force long lead-time tool program will come in. As predicted by STEEL last Dec. 5, all the Air Force's \$70-million allocation was let by the end of December. Most of these tools will not be shipped until at least the last half of this year, many will carry through into 1957.

And industry men are expecting that the Navy's turbine and gear program will be completely obligated during the year. That means \$60 million in new orders. It's even possible that naval shipyard modernization programs will be launched.

**Politics**—But it's unlikely that defense spending will do better than equal that of 1955. Though the Air Force still needs tools for current production, to place new orders now would only mean adding to backlogs. Further orders could be left until at least the last half of the year without a loss of delivery time. And the Army has

## Machine Tool Shipments Mount

(Millions of Dollars)

### Cutting Type Tools Only

1956*	900
1955	660
1954	892
1953	1191

Sources: National Machine Tool Builders' Association  
\*Estimated by STEEL

little need for more machine tools.

Point to watch: Democrats may try to make election-year capital of Republican handling of the Vance plan. If an investigation seems likely, more money could always be thrown into the machine tool pot. The Defense department is rethinking its machine tool purchase philosophy (see following story on page 39). Few feel that peacetime spending will ever return to the 1953 level—\$535 million, which was 45 per cent of industry's output. In 1954 defense-rated shipments were down to \$214 million, and fell to \$92 million in 1955. Look for a new pattern, with steady year-to-year spending of about \$100 million for defense-rated tools. They'll be put to work as soon as delivered.

**Solid Ground**—This forecast isn't deflating builders' optimism for this year. Says Louis Polk, president, National Machine Tool Builders' Association, Cleveland: "With no relief from taxes and other costs in sight and with wage increases a normal part of the economy, the only way a manufacturer can continue to meet competition is by the installation of machines which will increase productivity and reduce cost per piece produced."

Kearney & Trecker Corp., Milwaukee, and other builders are hoping that this philosophy will give them a large share of industry's spending for new plant and equipment, which may jump \$3 billion above last year's record. Already, programs are shaping up for March and June placement which bear out this feeling.

**Sellers**—What types of machines are in greatest demand? For some

builders, like Norton Co., Worcester, Mass., it's true that "automatic cycle machines are replacing the jobbing machine as the machine tool industry's bread and butter." One of its 1956 grinders (photo on page 37) grinds a shoulder and a diameter simultaneously, has automatic unloading and loading and automatic wheel truing. Cross Co., Detroit, says that the big demand will be for transfer machines.

But you can get as many answers as you ask questions. Ex-Cell-O Corp., Detroit, takes the middle line: "There's a trend towards standard machines with automatic fixturing." Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., and Warner & Swasey Co., Cleveland, agree that "standard machines are still the backbone of industry." Says Bullard Co., Bridgeport, Conn.: "There's a definite trend toward wider use of automatic controls, where manufacturing volume warrants the expenditure. But there will always be a place for the manually operated machine."

All agree on the major point—1956 will be a good year. There are two barometers to watch: 1. How fast can the industry get its monthly shipments above the \$70-million figure? (which was as high as it was able to go in 1955). 2. Will order cancellations stay at their present low level?

## Deferred Wage Increases

At least 2.75 million workers are covered by long-term contracts that specify the size of wage in-

crease they will receive this year. Of these, nearly 1.5 million are in metalworking — primarily autos, farm equipment and electrical goods.

The Labor department's Bureau of Labor Statistics says most workers in manufacturing and mining industries will get their increases during the second quarter, though some manufacturing groups are scheduled for third-quarter review. Most of some 350,000 transportation workers, employed largely in trucking and local transit, will be boosted in the first quarter of the year.

Among industries in which major wage negotiations are scheduled because of contract expirations or reopenings are: Steel, aluminum, airframes, shipbuilding, petroleum, rubber and the telephone industry.

## Export Quotas Set on Metals

Copper, copper scrap and iron and steel scrap export quotas for the first quarter are the same as they were in the fourth quarter of 1955.

The Department of Commerce quotas are: 3000 net tons for new and old copper scrap; 6000 net tons (copper content) for new and old copper-base alloy scrap containing 40 per cent or more copper; and 600 net tons for copper-base alloy ingots and other crude forms.

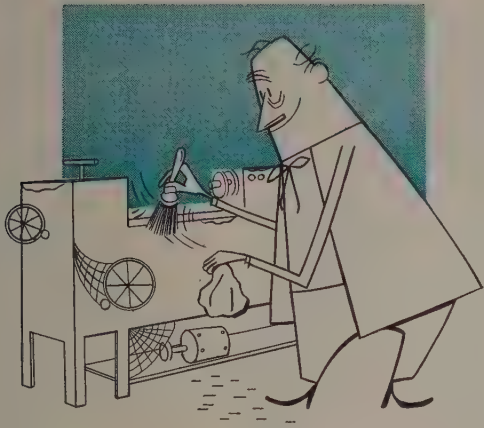
Unrefined domestic copper, previously not approved for export, will be licensed on an open-end basis. Open-end licensing of other commodities continues.

## '58 World Copper Capacity: 3.2 Million Tons

Some Jan. 9 copies of STEEL carried an erroneous table on world copper capacity for the next three years. World-wide expansion will bring these increases: 1956—229,550 tons; 1957—105,500 tons; 1958—123,620 tons. World capacities will be:

	(net tons)
1958	3,196,667
1957	3,073,047
1956	2,967,547





*Old policies get new twist as DOD suggests . . .*

## Put Reserve Tools To Work

IF IT WORKS out, the Defense department's new reserve machine tool and facilities policy will be pointed to as a splendid example of getting the most for the defense dollar. If it doesn't, there will be a lot of "I told you so's."

The new policy does this:

1. Allows tools to be borrowed from mobilization reserves to meet urgent production schedules (under the former schedule, such tools were untouchable except in an all-out defense emergency; new tools were going into storage while the military had to make out with whatever was on hand).

2. Permits each military department to budget for its own tools, including those needed for current programs, mobilization reserves and replacement programs.

3. Provides for an annual review of tools in "packages"—integrated groups or lines of tools needed to produce a specific end item. Review will determine if the package is still needed, its completeness and whether any of the tools in it become obsolete because of technological progress or because of design changes.

**Borrowing**—The borrowing feature will work like this: Say a type X tool is needed to get a new guided missile into production. To get it from industry (with machine tool backlogs what they are) might take 18 to 24 months. So arrangements will be made to

borrow that tool from government stand-bys with the understanding it will be replaced just as soon as a similar tool can be procured.

Through the new policy, the Defense department hopes to: 1. Meet changing military mobilization reserve requirements. 2. Insure availability of up-to-date tools. 3. Permit flexibility to get full benefit from new, more efficient equipment and techniques. 4. Train personnel to operate new tools. 5. Have a more realistic basis for reviewing military machine tool requirements. 6. Get rid of the start-stop feature of past military machine tool programs.

The outlook is that there will be no significant change in machine tool buying by the armed forces. But that could change, depending on just how economy minded the Administration and Congress get when it comes to defense appropriations. You can, in fact, get better than even money from some high sources that machine tool buying by the military will be sharply cut back, though more will vote for "no big change."

**Dissent**—The plan is a long way from satisfying everybody. Some of the objections are: 1. It will lead to pirating of existing standby production lines (tools will be borrowed and not returned). Integrated reserve facilities will become a thing of the past because

of the borrowing and/or because of packages being declared no longer essential.

2. The plan is a way of avoiding spending. Economy-minded defense officials and budget bureau planners won't allow money to be spent to replace borrowed tools.

**Holes**—It is granted by DOD planners that borrowing will leave holes in the packages. But they're working on this premise: "It's better to use the tools where we need them now rather than to leave them locked up somewhere just in case we might need them at some indefinite time in the future." They admit that in an emergency any gaps caused by the borrowing would have to be filled in by scrounging up whatever they could. It's hoped holes will be filled in before such an emergency.

As to whether money will be allowed and borrowed tools replaced, that bears watching.

Details of the new policy are still being worked out. Expected to be among them: A request for an annual appropriation to maintain a reserve fund to buy tools needed to meet emergency production schedules. As money from the fund is spent, a new appropriation would be sought to bring the fund back to its original size (current thinking is for a fund of about \$100 million).

### Congress Studies Mergers

Hearings begin today (Jan. 16) on two bills aimed at tightening merger regulations. One bill would require advance notice of the intent to merge (to the attorney general and Federal Trade Commission).

The other bill would give FTC powers (as the attorney general now has) to ask for a preliminary injunction barring a contemplated merger.

### B & T Firms Merge

B & T Machinery Co., an affiliate of Buss Machine Works, Holland, Mich., acquired B & T Engineering & Sales Co., Detroit. B & T Machinery makes zinc and aluminum die-casting machines.



These gage blocks, accurate to  $\pm 0.000008$ -in., verify spacings

## Gagemaking: Up In 1956

SALES of gages and inspection devices may set a peacetime record this year. Hand gages sales could total \$40 million, with air gages and other mechanical inspection devices adding another \$20 million.

F. O. Hutchinson, vice president of Continental Machines Inc., expects gage block and gaging system sales to equal or exceed the company's best peacetime year, 1955.

He points out that since gage blocks are the ultimate standards by which all inspection gages and instruments are calibrated, sales should reflect the trend for all gaging equipment.

**Confirmation**—W. J. Greene, vice president of L. S. Starrett Co., expects gage sales this year to be up 10 per cent over 1955's. Big buyers of gages and other inspection devices are the government and the automotive, aviation and machine tool industries.

Wallace Carroll, president of Simpson Electric Co., a division of American Gage & Machine Co.,

Chicago, looks for sales to equal or top his firm's all-time high. He points out that prices were stable this year, but warns 1956 may see a 5-per-cent increase owing to labor and material price boosts.

Gagemakers generally meet the shortage of skilled help by training their own. Says one: "It's a problem that's always with us."

**Automation**—Its effects have yet to make their full impact. One Ohio company that does 25 per cent of its business with automated plants finds fewer hand gages and more air gages are needed.

Mr. Hutchinson says automation is behind the introduction of automatic gaging and segregating devices and the automatic machines that incorporate automatic size control.

He thinks that while the trend to automation may retard the expansion of manual gaging equipment sales, it should provide a broader market for gage blocks and special length standards. Both are essential to the setup and cali-

bration of automatic gaging and automatic sizing machines.

**Better Materials**—Aiding in the fight for accuracy are long-wearing alloys, such as titanium carbide and chrome carbide. Webber Gage Co., Cleveland, uses chrome carbide in a set of gage blocks accurate to one-millionth of an inch. Such blocks are said to last 50 times as long as those made of standard alloys.

## Flying High

Commercial orders swell aircraft backlogs on West Coast. Los Angeles area gets major share

WEST COAST aircraft plants entered 1956 with an aggregate backlog of over \$7 billion, up more than \$1 billion since the start of 1955. Of significance is the continuing trend toward more commercial orders.

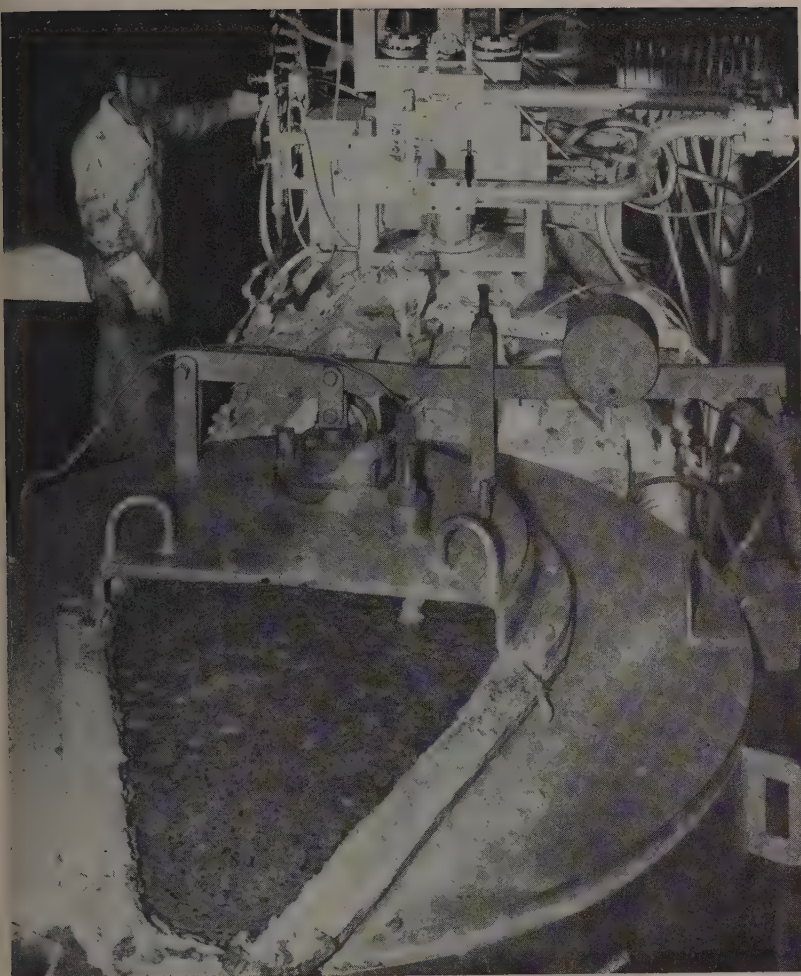
A year ago west coast plants had a commercial backlog of \$270 million; today, it has climbed beyond \$1.75 billion, and industry officials fully expect \$2 billion before the first quarter ends. Most executives say America's entry into the jet transport field is the primary reason.

**Defense**—Production of military aircraft continues high, with present programs scheduled to extend through 1957. The trend in military airpower is to greater speeds, requiring advanced electronic devices to compensate for the slowness of human reactions.

**Influence**—In 1955, the aircraft industry on the west coast employed more than 280,000 people, highest since the peak year of 1943. Aircraft payrolls were \$1.25 billion. The Los Angeles area employs about 190,000 people, and has a weekly payroll in excess of \$18 million. Aircraft backlog in Los Angeles exceeds \$5 billion, with the high increase in commercial backlogs more than offsetting military order declines.

Industry officials believe that this backlog indicates a continuing role for production of aircraft and aircraft parts as the Los Angeles area's largest source of income and its largest manufacturing industry.





Dow Chemical Co.

*Hot chamber diecasting paves the way as . . .*

## Magnesium Expands Market

THE MAGNESIUM industry has been experimenting with hot-chamber diecasting. Result: Magnesium producers have found the key to competitively priced castings and the wedge which may open the door to new and expanded markets.

**Dollars & Cents**—Pricewise, the process can compete with zinc hot chamber diecasting and aluminum cold chamber diecasting.

The new process is fast. Electric motor end frames are being produced with three cavity dies at the rate of 600 an hour. Point to remember: These machines are designed for continuous production. They must produce in sub-

stantial volume to keep unit prices competitive.

There are other factors which are pointing toward success for the new process: 1. High casting efficiency reduces inspection costs. 2. Molten magnesium can be handled in steel equipment. 3. The castings cool rapidly after extraction and can be handled with little fear of distorting the piece produced.

**Users**—Automakers are showing increased interest in the future of hot-chamber magnesium castings. Their current uses of them include: Steering column shrouds, brackets, caps and collars; fan spacers; oil seals; window bracket

assemblies and signal switch and fuel pump housings.

Appliance manufacturers are purchasing electric motor end frames. The aircraft industry is putting magnesium motor and actuator parts and miscellaneous components into its purchasing schedules.

**Progress**—Dow Chemical Co. has four hot chamber units in operation. A leading automotive parts manufacturer has one in use and plans to install at least five more.

**Outlook**: The process will continue to be a field of opportunity for magnesium producers. One industry spokesman reports: "Consumption of magnesium diecastings will increase from four to eight times by the end of 1957."

### Venezuela Awards Steel Mill

A contract has been awarded to two Italian firms to build a 420,000-ton steel mill at Puerto Ordaz for the Venezuelan government. The contract price is \$173 million, of which \$29 million will be paid this year and the remainder in six equal yearly installments. Operations will start in the first quarter of 1958. Full production will be reached in 1959.

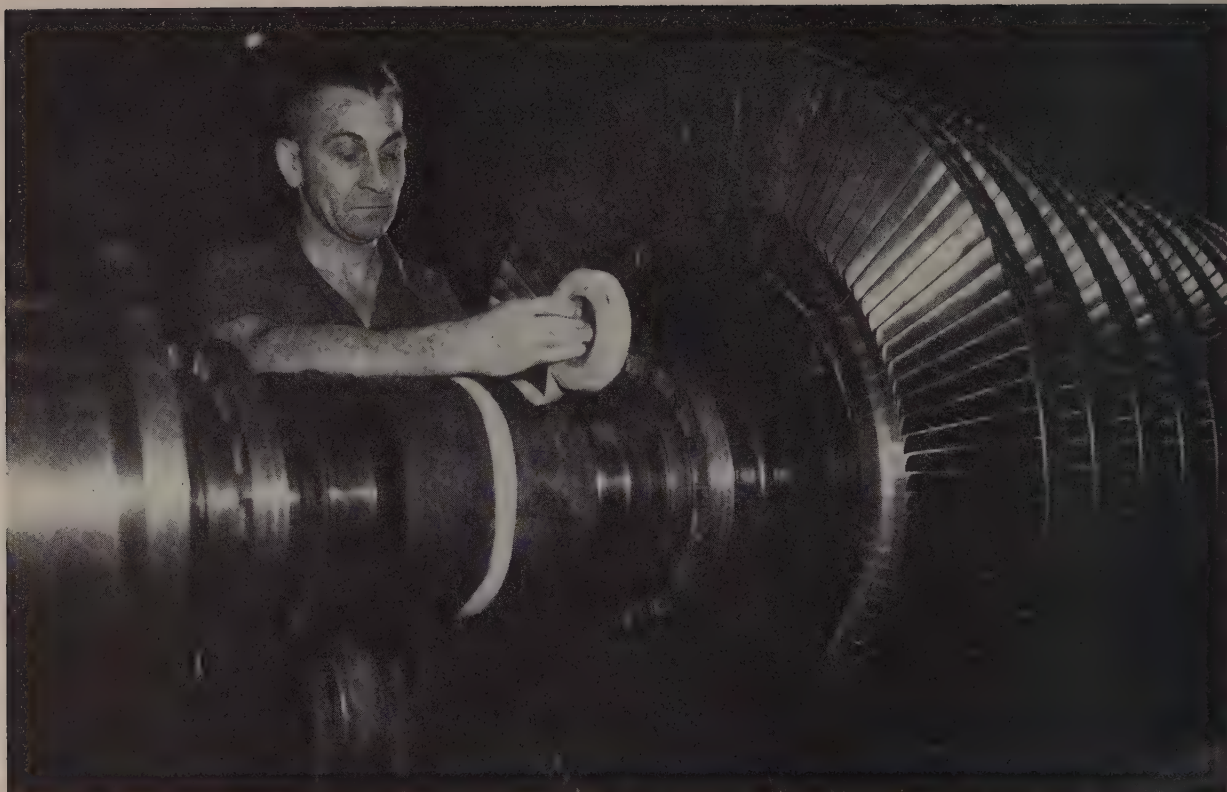
The Italian companies are Fiat Societa per Avione and Innocenti Societa Generale per la Industria Metalurgica e Meccanica. They were competing with three U. S. firms (Koppers Co., Pittsburgh; Westinghouse Electrical International Co. and Mesta Machine Co., both of New York). Other bidders included British, German, Belgian, French and Norwegian groups.

The mill will produce rail and basic construction materials during its first stage, when annual production will be 300,000 tons. Increases in these products and additional items like hot and cold sheet, tin plate and galvanized sheet are provided for in the second stage. All raw materials will come from Venezuelan sources.

### Metal Powders Sales Boom

Sales of metal powders soared to 56,000 tons last year, up 20,000 tons over 1954. Iron powder sales rose from 18,000 tons in 1954 to 30,000 tons last year, says the Metal Powder Association.





Turbine rotor will be protected during next production stage by a piece of fiber held in place with pressure-sensitive tape

## Tape Aids Metalworking

WHEN THE MODEL-T was in style, dealers doing touch-up work were hard pressed for masking tape. They even bought large quantities of surgical tape from local druggists. This was a first step toward development of the pressure-sensitive tape industry.

Sales in 1955 topped the \$100-million mark. Each year brings hundreds of expanded applications for Scotch, Pres-Stix, Behr-Cat, Mystik and Polyken-type tapes. Since the industry's start (about 1925), some 30 companies have entered the field.

**Uses Grow** — Last year total sales for most companies took substantial jumps as the range of metalworking applications continued to expand. This year will be no exception. Permacel Tape Corp. is making a new tape which simplifies the laminating of metal or transparent sheeting.

Another tape with a bright future: Double-faced tape which is used for holding metals during grinding and cutting, particularly when the metal cannot be easily adapted to clamp-type chucks, vises, etc. The increased use of nonferrous alloys, which do not react to magnetism, call for the use of double-faced tape, too.

**How It's Done**—The tape is laid out on the bed of the magnetic chuck or milling machine bed. The part to be worked is then placed on the tape which can hold the piece securely during the operating cycle, even though coolants may be used. In fact, the part often has to be tapped with a mallet to be removed.

From its beginnings in the automotive field, the extensive use of pressure-sensitive tape has spread to the aircraft, appliance and electrical manufacturing in-

dustries. Automakers continue to use the tape for masking, but are finding hundreds of new applications. It is used for winding coils, protecting chrome pieces, covering and holding wires, etc. Bundling small parts and protecting finished surfaces with tape continue to be expanding areas for sales.

**Steel, Too** — Behr-Manning Division, Norton Co., reports that steel manufacturers are using tape for bundling metal coil and strip. Various kinds of pressure-sensitive tape also are being used to protect the edges of cutting tools and stainless steel.

**Future** — Minnesota Mining & Mfg. Co. reports: "Pressure-sensitive tape fits right into the trend toward automation due to its ease of application, holding and bonding characteristics and variety of sizes and colors."

In all phases of metalworking—stamping, fabricating, machining, finishing, welding, etc.—pressure-sensitive tape will continue to find new uses. Why? It helps speed production. It helps reduce unit cost.



# LP Gas Sales: Up, Up, Up

A 17.2 per cent gain over 1954's record year underlines the boom. Additions to underground storage, proposed and under construction, total 292 million gallons

PRODUCERS of liquefied petroleum gas have never had a bad year. Look for sales in this one to zoom up about 6,875,000,000 gallons.

Every year has been a record-breaker since the start of the industry in 1922 (sales were 223,000 gallons). Biggest increase was last year, a whopping 880,467,000 gallons.

Behind the sales drive are the advantages of LP gas: High thermal value, economical transportation as a liquid (it expands 270 times when used as a gas) and the supplying of its own pressure feed.

**Increases**—Industrial and miscellaneous uses totaled 431 million gallons in 1955, a 7.3 per cent increase over 1954.

New applications and high business activity kept demand high despite competition from natural gas. LP gas for flame cutting is making gains.

Interest in LP gas for industrial tractors and lift trucks stays high; most of the larger lift truck makers offer factory-equipped models

approved by Underwriters Laboratories.

**Big Users**—Domestic and motor fuel sales in 1955 are estimated at 3,661,000,000 gallons by Phillips Petroleum Co., Bartlesville, Okla. This is an increase of 15.3 per cent over 1954. Tank sales, up about 25 per cent, indicate the trend to house heating with LP gas.

Growing fast is the use of LP gas for motor fuel. An estimated 671 million gallons were used in internal combustion engines in 1955. There are over 250,000 LP gas tractors in the U. S.

Tractor conversions to LP gas were up 71 per cent in the first six months of last year. Carburetor sales (tractors excluded) were up 87 per cent. Taxicab fleets also are being converted.

**More Growth**—Sales of LP-gas appliances show a healthy increase. In 1955, range sales were up 11 per cent, water heaters showed a 13-per-cent increase.

Production capacity was increased nearly 850,000 gallons a day by the addition of 22 plants

in 1955. This year, it is estimated that 12 new plants will add nearly 500,000 gallons a day to capacity.

## Utilities To Hike Spending

After reaching a peak in 1953, spending on new plant and equipment by electric utilities has been sliding for the last two years. Now it's headed back up for a new record.

According to the Edison Electric Institute, \$2.9 billion will flow this year. A little over \$1 billion is for new generating plant. For the first time in a decade, these outlays will be topped by spending for distribution facilities. Power companies will plunk down \$1.2 billion for copper and aluminum cable, transformers, poles, insulators, etc.

Says Harlee Branch Jr., president of Edison Electric Institute: "Our construction expenditures over the next ten years should average about \$3 billion a year, rising to about \$4 billion by 1965."

## ODM Issues Tax Write-Offs

Projects totaling \$427,378,199 can be built under certificates for fast tax write-offs issued during the first two weeks in December by the Office of Defense Mobilization.

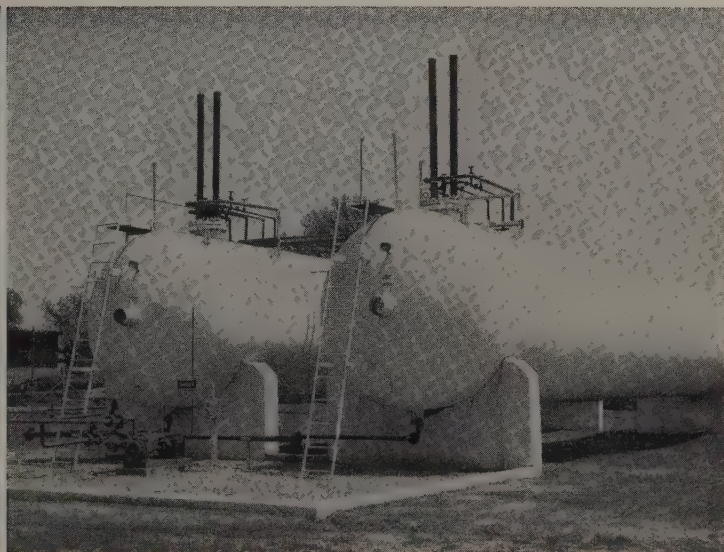
Bethlehem Steel Co. will get a fast tax write-off on a \$22-million project for electrolytic steel plate at Sparrows Point, Md.

## LP Gas Sales

thousands of gallons

1956	6,875,000
1955	6,006,000
1953	4,932,009
1950	3,482,567
1947	2,209,797
1944	1,060,156

1956 sales estimated by STEEL  
1955 sales estimated by Phillips Petroleum Co.  
Other figures from U. S. Bureau of Mines





*Aircraft, missiles have priority in Air Force's . . .*

## Industrial Readiness Planning

THE AIR FORCE has won a major battle—official blessing of its “production readiness” program to replace the traditional concept of a prolonged industrial build-up after attack.

It will mean: 1. Stockpiling of new industrial equipment, at least as far as the Air Force is concerned, is just about down the drain. New equipment will go right to production lines or into new installations instead of into a reserve from which it might take six months or more to get it out and operating.

**Stabilizing—2.** A determined effort to end the feast and famine in the aircraft industry. Instead of, for example, putting a plane into production, building to a peak, then letting production fall off sharply, emphasis will be on attaining a plateau and holding output there till the end of the run.

3. Insistence on maintaining as broad a base of subcontractors as reasonable. If there are cutbacks in aircraft or missile buying, it will be felt proportionately all along the line instead of subcontractors bearing the brunt of it when the prime contractor pulls jobs back into his own plants.

4. Possible Air Force financial aid and/or fast tax write-offs for

plant expansions or new facilities.

**Stocking—5.** Inventory build-ups at assembly points of equipment, parts and fabricated components for the most important aircraft, missiles and related equipment. Build-ups at supplier level of raw material and semi-finished components on the same highly selective basis.

6. Contractors will probably be allowed to do more advance buying than at present, possibly smoothing out demands for basic raw materials.

7. Multiple sources of supply will be developed if economically feasible.

**Safeguarding—**Here's what the Air Force hopes to accomplish: 1. Deter war by having a modern Air Force for defense and retaliatory missions.

2. Improve the chances for a maximum of vital weapons makers to survive the first blow of a general war in a condition to start immediate all-out production of selected weapons.

3. Have capacity available to quickly expand output for any “little wars.”

4. Maintain the health of the aircraft industry.

**Planning—**Two concepts will be developed: 1. Production Com-

pression Capability—to allow an immediate bulge of production, in emergency, of selected vital weapons. It will call for a maximum work week, draining of the inventory of finished components, equipment and subassemblies on hand at the assembly plant.

2. Production Acceleration Capability calls for a quickly expandable production base ready to go—there would be a steady, continuing build-up rather than a sudden all-out effort as in Production Compression Capability.

**Priorities—**Under the program all weapons will be given a priority. Top will go to certain aircraft, guided missiles and supporting equipment needed for critical missions. Performance and versatility of the weapon will be considered, along with its ability to be produced, vulnerability of producing facilities and inventories.

Checks will be made every six months to update planning.

Industrial dispersal will be a key factor in selecting multiple sources of supply, or in construction of new facilities when government money or aid is involved. But the Air Force isn't overlooking the economic facts of life either: Present facilities will be utilized, if possible, before any new ones are built; the need for dispersal will be weighed against the need for timely delivery; the dispersal question probably will be disregarded if facilities require expansion.

## Here and There

The Atomic Energy Commission is encouraging private industry to build and operate plants to recover usable materials from atomic reactor fuel elements . . . American watchmakers are asking ODM for one-third of the U. S. market “to maintain facilities and engineering and labor skills needed for defense production” . . . The nickel situation is getting a close look, but odds are against any expansion; it's thought the minimum stockpile goal will be reached before new facilities could be brought in and supply then will take care of itself.



# Here's how **C/R** **COOPERATIVE** **RESEARCH** *can help you*

## HELP YOU ENGINEER YOUR PRODUCT. ELIMINATE TOUGH TROUBLE SPOTS AND SAVE YOU MONEY IN FLUID SEALING AND RELATED FIELDS

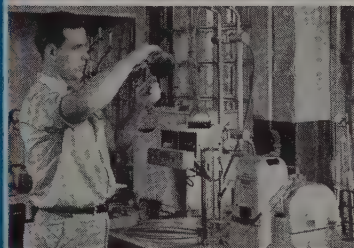
Developing a new product or rectifying trouble in a present one? Why not supplement your own engineering facilities with C/R Cooperative Research? In the areas related to oil seal design, lubricant, chemical, gas, or air retention, and foreign matter exclusion—as well as in the development of synthetic rubber and impregnated mechanical leather parts—Chicago Rawhide's developmental facilities are the most extensive in the country.

All of them are at your service . . . for help with your critical or unusual problems. You may be sure that your design specifications, performance requirements, and production controls will be met to the letter. A few of the many ways in which C/R Cooperative Research serves other leading manufacturers are pointed out on this page. We'll be glad to help you.

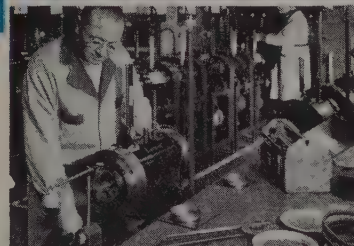
**INFORMATION** . . . Comprehensive brochures and catalogs are available to give you the complete scope of C/R products and services. Write for your copies, and please indicate your area of interest.



**DESIGN** . . . When your product is on the drawing board is the time to correlate design and materials with performance requirements. C/R's expertly-staffed engineering groups working in close cooperation with the material labs have done it for others . . . and can do it for you.



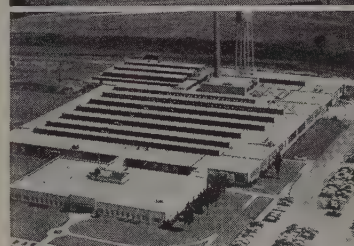
**MATERIALS** . . . Pioneers in the development of Sirvis (mechanical leather) and Sirvene (synthetic rubber) parts for oil seals and other mechanical applications, C/R will custom-develop materials for your special needs in our synthetic rubber or leather laboratories.



**PRODUCT TESTING** . . . Many products, new and present, need extensive checking. C/R testing labs often work many months to verify designs, eliminate trouble. This is standard procedure on all C/R stock products . . . essential in developing yours.



**TROUBLE SHOOTING** . . . Auto and heavy equipment makers, as well as manufacturers in most fields you can think of, have solved difficult sealing and related problems with the help of C/R Cooperative Research. You can, too . . . and save time, trouble and money.



**PRODUCTION** . . . Six plants, operating as extensions of C/R Cooperative Research, provide laboratory-like quality control, timed to your needs. C/R Sales Engineering follows through to coordinate and assure satisfaction.



**EXPERIENCE** . . . Broadest in the field. Proof? More automobiles, farm equipment and industrial machines rely on C/R Oil Seals than on any similar sealing device. C/R diaphragms, boots and gaskets are in the same top categories.



## CHICAGO RAWHIDE

### CHICAGO RAWHIDE MANUFACTURING COMPANY

1245 Elston Avenue, Chicago 22, Illinois

Offices in 55 principal cities

In Canada: Super Oil Seal Mfg. Co., Ltd., Hamilton, Ontario  
Export Sales: Geon International Corp., Great Neck, New York

#### C/R Products

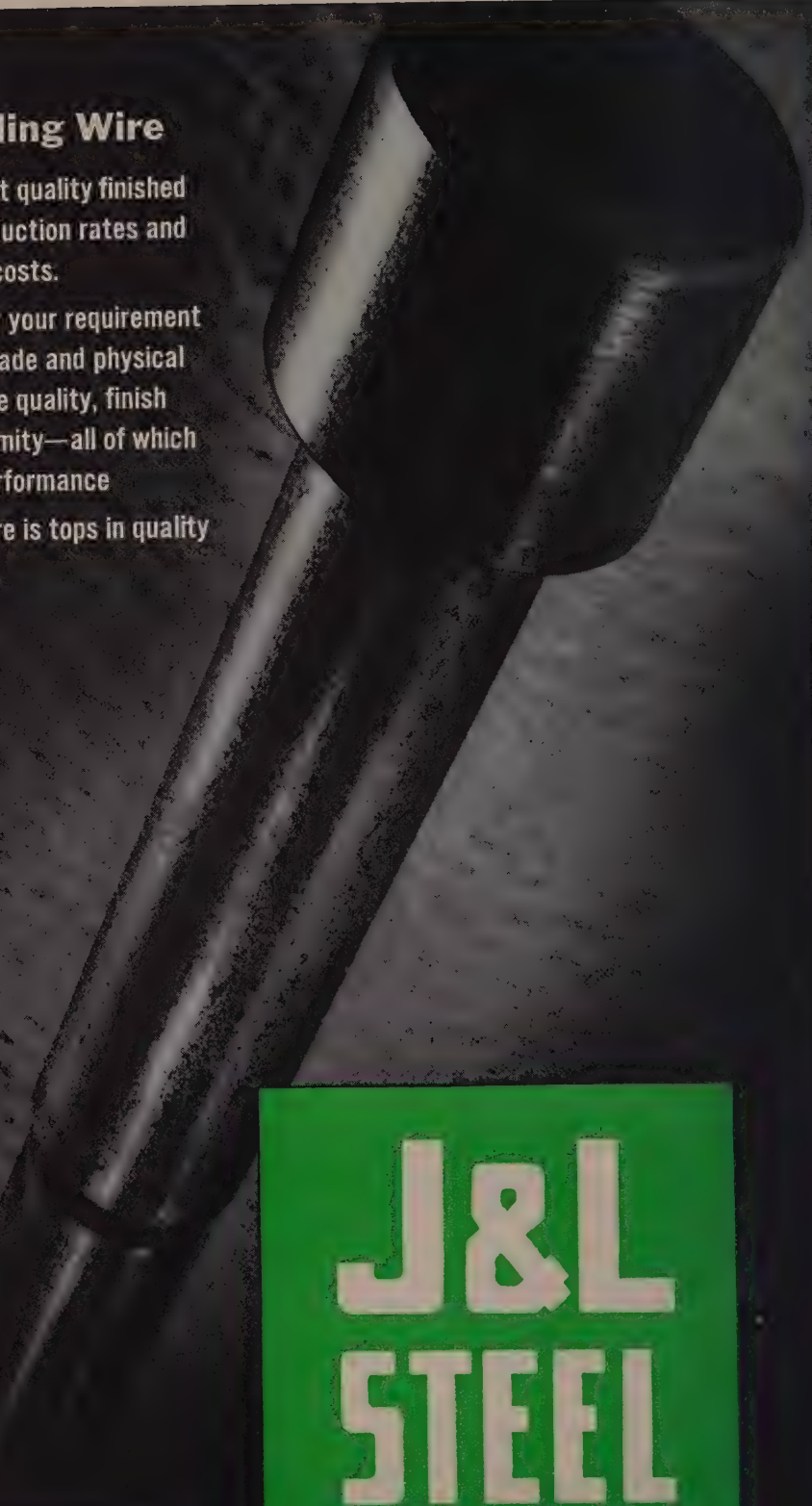
C/R Shaft & End Face Seals • Sirvene (synthetic rubber) molded pliable parts  
• Sirvis-Copper mechanical leather cups, packings, boots • C/R Non-metallic Gears

## J&L Cold Heading Wire

will help you get highest quality finished parts at increased production rates and lowest manufacturing costs.

It will satisfy exactly your requirement for precise chemical grade and physical characteristics, surface quality, finish and outstanding uniformity—all of which insure best heading performance

J&L Cold Heading Wire is tops in quality  
—competitive in price.

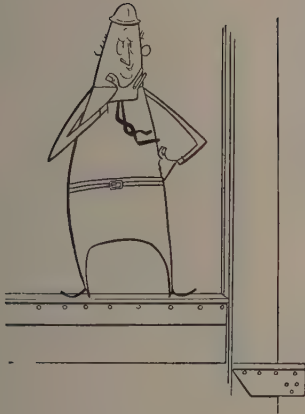


**J&L  
STEEL**

***Jones & Laughlin***

STEEL CORPORATION — Pittsburgh





## Atlantic's Girdler Sees Whole Picture

DOWN at Atlantic Steel Co., they like to tell the story of the first visit to their plant by Earle C. Smith, Republic Steel's chief metallurgist.

**Visit**—Mr. Smith and his wife were returning from Florida and stopped in Atlanta overnight. Mr. Smith hailed a cab and asked to be driven to the Atlantic Steel plant. He didn't get out of the cab but spent 10 or 15 minutes studying the layout and then told the driver to return to the hotel.

"Now, what in the world was the reason for that?" Mrs. Smith wanted to know.

"I got one of the best lessons of my life out there," replied Earle. "Now I can see why so many good men hit the steel industry out of Atlantic—men like Tom Girdler, Bob Gregg, Zack Collier, Charlie Elliott and a lot of others. Anybody in there has to know all the answers. When they move to a bigger mill, it is just a matter of multiplication."

**Whole Basket**—That's one of the reasons Joseph Hayes Girdler gets such a kick out of his job as vice president of operations at Atlantic.

"Here we have a whole basket of eggs. Maybe they're only pullet eggs, but we see the whole picture of steelmaking."

"When we start to build something, such as our new \$8.5-million combination rod and bar mill, it becomes a personal project with all of us. We know that when the new mill is completed

next fall, we are going to have one of the most modern in the business. We think we will be able to make the big boys compete with us, instead of trying to compete with them.

"We get a genuine satisfaction from our part in building up southern industry. And, believe me, southern metalworking really is on the move.

"Another nice thing about a small mill is the closer relationship you get with your men. Down here, we think we have a high class of labor, and the productivity figures, compared with other regions, bear us out."

**Atlanta Born**—Joe has a native right to his southern pride. He was born in Atlanta while his father, Tom M., was general superintendent at Atlantic Steel, before going to Jones & Laughlin and later becoming head of Republic Steel. Joe spent ten years in the oil business after being graduated from Lehigh University. He joined Atlantic in 1941 as assistant open-hearth superintendent.

Although Atlantic is in the middle of a substantial expansion and modernization program—including a second large electric furnace just placed in operation, a new main office building, large additions to warehousing facilities and the new rod-bar mill—Joe says it doesn't want to become a big mill. It only wants to be more modern than its competitors.

# Communicating for Profit

Makers of intercommunication equipment are plugging for more industrial applications. One result: A \$30-million business in 1956 for them

"COSTS DROP when your voice runs your errands," points out Webster Electric Co., Racine, Wis. That idea and others like it will help makers of intercommunication equipment do about a \$30-million business this year.

Industry's campaign to cut costs is one reason why intercom producers report 1955 business was up as much as 40 per cent over 1954's and explains why a similar increase is expected in 1956.

**Case**—Reports one user: A close study comparing the cost of a switchboard with that of an intercom saved about \$150 a month in the filing department alone. An additional \$50 was saved by eliminating telephone callbacks when outside callers needed information not at hand.

Says another: "Office efficiency

is up 50 to 60 per cent because 'desk absenteeism' is reduced to a negligible minimum, flow of information is speeded. The primary advantage of the system is that required information is gathered quickly, without confusion and without two or three people having to leave their desks to make a combined report in somebody's office.

"Many quick decisions are obtained by reaching several executives on an intercom conference call; no one has to leave his desk. The number of meetings and conferences is appreciably reduced."

**Summary**—"Advantages of installing an intercom system include: Quick contact with key personnel, rapid transmittal of information; greater office efficiency; reductions in desk absenteeism,"

sums up Harold Rusten, of Radio Corp. of America's Engineering Products Division, Camden, N. J.

"Think of intercom as your personal telephone circuit without the need of a switchboard or switchboard operator. A flick of a finger places a person-to-person call directly to any individual or group you want to reach in any of your offices, warehouses, plants, stockrooms, shipping docks or yards, leaving your regular telephone free for outside use," says Dan F. Kagan, sales manager, Talk-A-Phone Co., Chicago.

**Price**—Two-station systems may be had for well under \$50. "For rough calculations, six cents per station per day will cover not only interest for the initial investment but also all service and operation expenses," says Webster Electric's W. E. Dent.

You can lease from several intercom producers. "Industrial customers, particularly, are interested," reports Norman M. Howden, Stromberg-Carlson Co. "Since under such an arrangement all maintenance and service requirements are our responsibility, this offers many attractions."

**Use**—Versatility of an intercom

## Canadian GE Uses the Intercom as an Industrial Tool

WHEN Canadian General Electric Co. Ltd. moved its power transformer plant from Toronto to Guelph, Ont., the company wanted to solve problems it had in Toronto. Two concerned job timekeeping:

1. A large staff had been required to operate inshop timekeeping centers—but timekeepers spent a lot of time waiting for work.

2. Records at the Toronto plant showed there usually was a delay of two weeks between the finish of a manufacturing operation and the time cost figures were available.

**Speed**—What CGE wanted was

a faster data gathering system—one that would provide the cost department with job data as soon as an operation was finished, so the information could be processed and analyzed by management in hours instead of weeks.

At the new Guelph plant, one central timekeeping office was set up, replacing seven inshop timekeeping centers.

**How It Works**—When a worker starts or finishes a job, he walks to the nearest of 27 intercom reporting stations and calls the central timekeeping office. Reporting

stations are placed so each worker loses minimum productive time walking to a station and reporting.

The call registers on a control station in the timekeeping office. A timekeeper answers and records the information on the worker's time card. The office handles more than 4000 job changes a week.

**Results** — The system achieved the company's original objectives and gave additional benefits:

1. Labor costs are compiled within 24 hours instead of two weeks; management has current figures to work with.



system is apparently limited only by the imagination. Here's one way a maker of the equipment, David Bogen Co. Inc., New York, uses intercom in its plant, according to Vinton K. Ulrich, general sales manager: "We connect certain intercoms into the system used for paging and background music. If a person is not at his intercom, by merely pushing another button it's possible to page him over the entire plant system. That's much faster than having our paging operator handle it."

## Railroads To Run Up Big Bill

Railroads have announced some big spending plans for the first three months of this year. The Interstate Commerce Commission's Bureau of Transport Economics & Statistics estimates that they will fork out some \$324 million, almost double their spending in last year's first quarter.

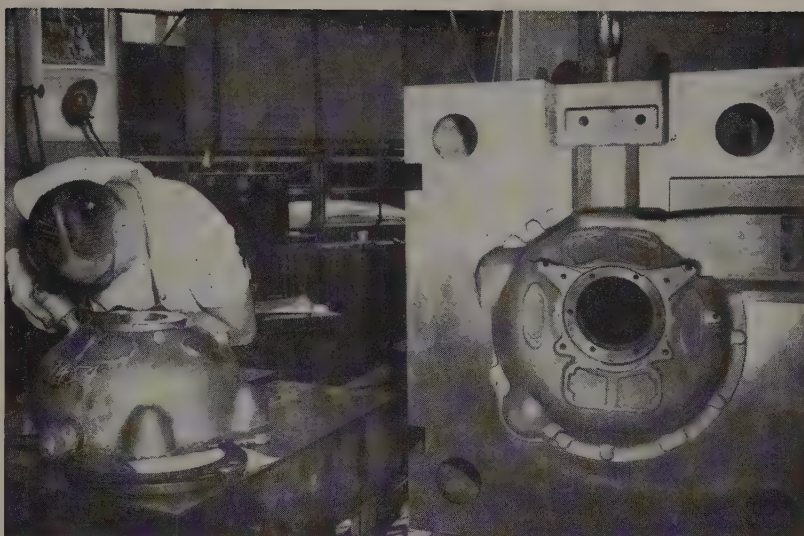
The increase is led by equipment spending, which will account for \$232 million of the total. It's up 111 per cent from the 1954 rate. Expenditures on road will be up, too, but only by some 33 per cent.

2. CGE operates with three timekeepers instead of the eleven it would have needed with inshop timekeeping—and two of the three devote most of their time to other work.

3. Workmen have more productive time since they don't spend so much time walking, waiting and visiting when making job reports.

4. Workmen lose less productive time as a result of mishaps like machinery failure or lack of materials. As soon as trouble develops, it is reported over the nearest station.

5. CGE gained 700 sq ft of production space by eliminating timekeeping centers within the plant.



Precision Castings Co.

# Record Shipments Coming?

Tool and die business will be up at least 10 per cent this year. New model change-overs in auto and other metal-working industries could push volume to all-time high

TOOL and die shipments will be up 10 per cent this year. Volume is predicted at \$750 million or better, equal to the record set in 1953.

Says George S. Eaton, executive secretary of the National Tool & Die Manufacturers Association: "The growing volume of incoming orders and a rising order backlog augur well for continued high level operations in early 1956 for the 2500 contract shops making up the special tool and die industry."

**New Models**—Strong demand should continue at least through the first half. "The even keener competition anticipated in household appliances, office machinery and radio-TV equipment will cause makers of these products to bring out new models as sales ammunition," adds Mr. Eaton.

"Extensive changes expected in the 1957 autos will mean a much greater demand for dies, jigs, fixtures, gages, molds and machines in 1956 than in 1955, when changes were relatively minor."

**Defense Factor**—Most of the tool and die industry's orders come from private industry. Exceptions:

Aircraft and guided missiles, where there is still much tooling to be done as new models are developed and put into production. A modern jet engine requires 20,000 specially designed and manufactured tools, jigs, dies and fixtures. Half that number sufficed for one of the most powerful piston engines of World War II.

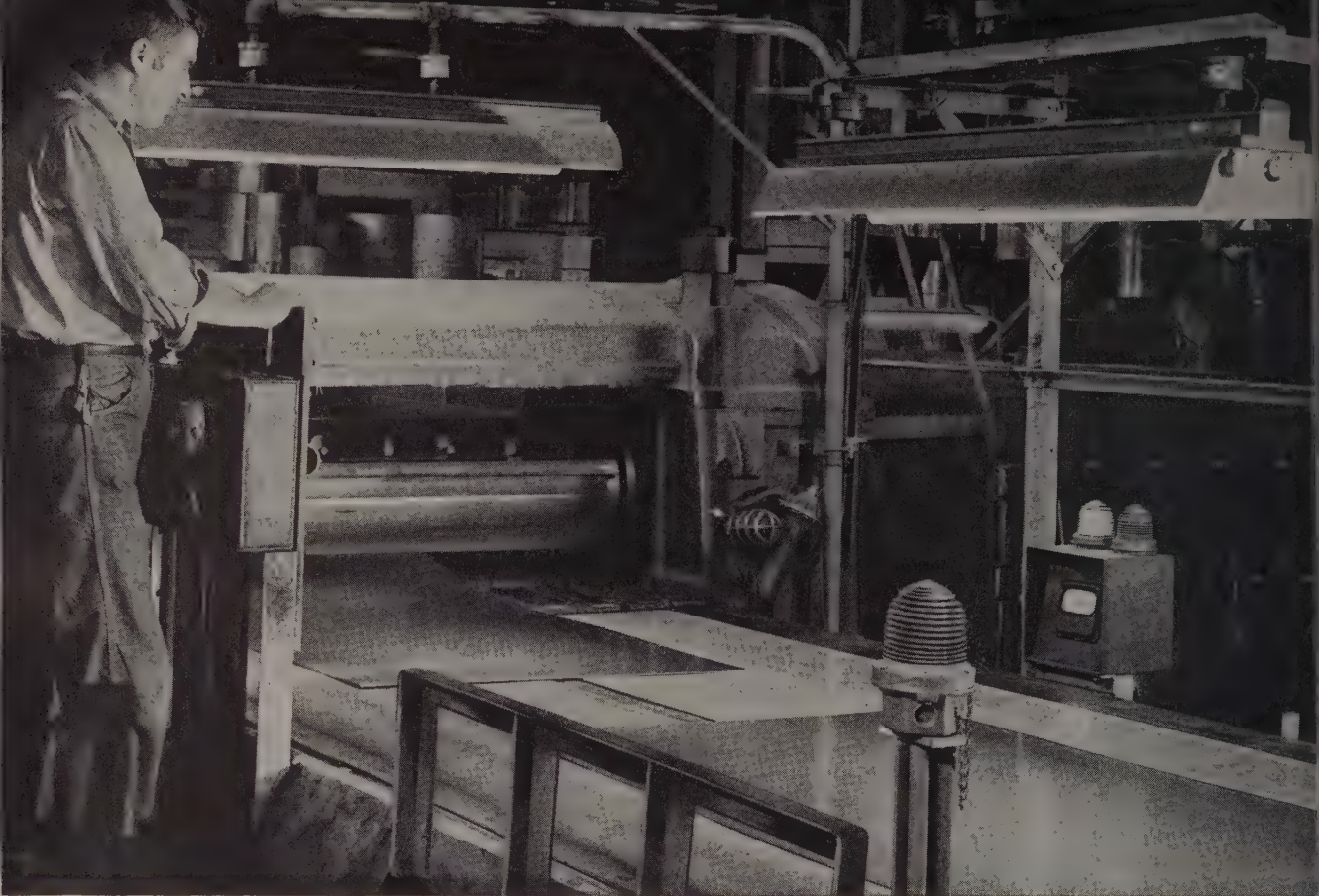
Mr. Eaton concludes that tool and die makers will continue to be a good market for machine tools and other equipment. They must continue to modernize to meet increasing complexity of products.

## New Slant on Piggyback

Fifty "different" freight cars have been bought for the Chicago, Rock Island & Pacific Railroad. Basic concept is a "strong, long-life underframe on which a demountable body can be placed."

Cars can be used not only for piggyback service, using a flatbed highway trailer, but can be turned into gondolas, hoppers, tank cars or even passenger baggage cars by fitting different superstructures.





## How Great Lakes Steel *X-rays* quality



Above: Stacking sheets after the X-ray check. Below: With dozens of tests passed and uniformity assured, the flat-rolled steel is O.K.'d for wrapping and delivery.



Why do sheets from Great Lakes Steel consistently meet customers' specifications? The X-ray machine is one of the answers. Here an indicator (shown above) signals the thickness of steel sheets as they pass on a conveyor belt. Any sheet failing to meet the established standard is immediately ejected.

Throughout the Great Lakes mills, modern machines and experienced men work together to maintain the consistent quality of our flat-rolled products. Our service includes close contact with customers by Great Lakes representatives, men who are concerned not only with steel production but also with the performance of our steel in the plants of customers.

The next time you have a problem in steel, give us a call. You will find that both quality and service are *consistent* at Great Lakes Steel.

### GREAT LAKES STEEL CORPORATION

Eccorse, Detroit 29, Michigan • A Unit of



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



## Where Aluminum Will Be Used On 1956 Cars

Car	Pounds Per Standard Car	Pounds Per Car with Automatic Transmission	Pounds Per Car with Automatic Transmission, Power Brakes and Steering
Chevrolet 6	10.77	12.88	12.88
Chevrolet V-8	13.15	15.26	15.26
Pontiac V-8	14.32	33.30	33.30
Oldsmobile V-8	16.51	36.67	50.80
Buick V-8	19.97	58.98	59.28
Cadillac V-8	—	—	63.05
Cadillac Eldorado	—	—	191.55
Ford 6	14.16	31.39	—
Ford V-8	17.27	34.50	—
Mercury V-8	19.84	40.67	—
Lincoln V-8	—	58.04	58.29
Continental Mark II	—	—	65.52
*Plymouth 6	17.58	53.58	64.53
Plymouth V-8	21.23	57.23	68.18
Dodge 6	20.35	56.35	67.30
Dodge V-8	23.30	59.30	70.25
DeSoto V-8	—	62.20	73.15
Chrysler V-8	—	65.17	76.12
Imperial and Crown Imperial	—	—	80.53
Packard V-8	19.80	78.30	—
Studebaker Champion 6	9.26	13.26	—
Studebaker Commander V-8	14.53	18.53	—
Studebaker President V-8	14.53	18.53	—
Studebaker Classic	18.17	22.17	—
Studebaker Golden Hawk	—	76.92	—
Nash and Hudson Rambler	24.32	38.09	—
Nash Statesman	22.27	33.05	—
Nash Ambassador 6	23.84	40.48	—
Nash Ambassador V-8	24.30	82.70	—
Hudson Hornet V-8	18.80	77.20	—
Hudson Wasp	17.86	26.59	26.92

\*Chrysler figures do not include its production of convertibles which use an additional 25 lb of aluminum per car for roof bows and roof actuating mechanism

## More Aluminum For Autos

ALUMINUM is a bigger word than ever in the automobile industry, says the Aluminum Co. of America, Pittsburgh.

Alcoa's survey shows that 1956 models are using 16 per cent more aluminum than did the '55 editions. The average number of pounds of

aluminum per car has stepped up from 29.6 in '55 to 35.2 this year. That means a record-breaking 246 million lb of aluminum will be used in 1956 passenger cars—if carmakers hit a production target of 7 million automobiles.

Estimates—Harry L. Smith Jr.,

Alcoa vice president for sales development and market research, points out that studies indicate aluminum applications on autos will rise to 49.8 lb by 1960; 81 lb by 1965. He adds: "If aluminum were applied to every possible automotive use, total poundage on each car would top 300 lb." That's quite a jump from Alcoa's earlier estimate in June, 1955, of 262 lb.

**Where It Goes** — According to Mr. Smith, part of the increase comes from more use of aluminum exterior trim. Right now, 7 per cent of automobile aluminum is used for trim. Look for that amount to almost double on '57 models. Anodizing processes mean that more colorful trim strips and grilles will be made of aluminum.

**Transmissions** — Almost 50 per cent of the aluminum goes into automatic transmissions. A good example are Buick V-8s. Only 19.97 lb of aluminum per car is used on a standard Buick. Adding the automatic transmission boosts aluminum in each car to 58.98 lb. Part of that jump is because General Motors changed transmission design to use another 14 lb of the light metal in its automatic jobs.

The growing popularity of push button shifting will probably write finis to standard shifts. It's a matter of time before automatic transmissions with aluminum parts will be a must item for every auto.

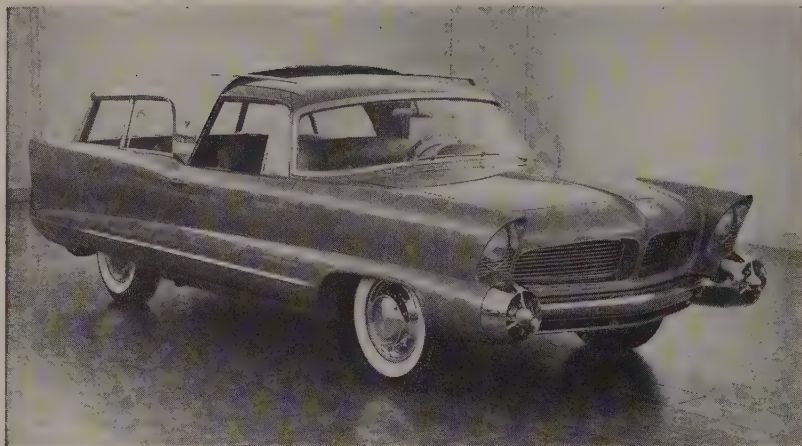
**Engines** — Some 30 per cent of total aluminum usage is for engines. With more and more gadgets being crammed into the front ends of today's cars, engineers are counting on aluminum to lighten the load.

Aluminum pistons are now common. Next, watch for aluminum cylinder heads, since higher compression ratios favor the heat dissipating qualities of aluminum.

**Breakdown** — Although engines, transmissions and trim account for most aluminum, wiring, brakes, power steering and plenty of fasteners are other spots where the lightweight metal is moving in.

Chrysler Corp. cars average 350 aluminum parts per car on all 1956 models and styles. General Mo-

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Cantilever top gives the Chrysler Plainsman its "long look"

tors cars average 73 parts and Packards and Packard Clippers 33—25 in the transmission. The other eight parts are pistons. Total weight is 63.5 lb. The Eldorado, by the way, uses more aluminum than any other car—191.55 lb. with all extras added.

Packard, which this year switched to an aluminum die cast transmission housing, substantiates Alcoa findings that die casting is the popular production method for aluminum parts. New models average 15.7 lb of aluminum die castings per car compared with 12.3 lb of die cast parts in 1955.

**Radiators**—Alcoa predicts that the next big advance for aluminum will be in radiator fins. Nash Ramblers had them in '55, but people in the business say there still are plenty of headaches.

**Cost Matters** — As one expert puts it: "Aluminum may not be better than copper for radiators, but if it costs less and is easier to get, it will be used."

If the copper situation eases this year, as it shows signs of doing, aluminum may receive a setback in the radiator section. As far as an all-aluminum radiator is concerned, best guesses are it won't come until engineers have a lot more answers to such problems as corrosion and stopping leaks in the tubes.

**Hot Spots**—Spurred on by forged aluminum wheels which appeared last year on Cadillac's Eldorado, Alcoa predictors offer aluminum brake drums as another automotive possibility.

Cautious engineers, however, suggest that right now installation wouldn't justify manufacturing costs.

**Bearings**—One of the more interesting uses of aluminum was reported last week at the Society of Automotive Engineers' annual meeting in Detroit.

R. S. Frank and W. J. Lux, Caterpillar Tractor Co., Peoria, Ill., pointed out that solid aluminum alloy and steel-backed aluminum bearings are excellent for high speed, high load applications. They've been tested on Caterpillar tractors since the end of World

War II. Long an experimental item in the industry, but with little actual use, aluminum bearings show more possibilities in the near future.

## Chrysler at Chicago

Chrysler Corp. went to the Chicago Motor Show last week and took the wraps off its experimental station wagon, the Plainsman.

Aimed at the suburbia population, the Plainsman boasts an overall length of 208 in. and is 60.2 in. high. It has a 115-in. wheelbase. Power supply is a special Chrysler V-8 engine with PowerFlite transmission.

Since the Chicago show primarily is a place to show off design ideas, the Plainsman sported such novelties as an electrically operated tailgate and a rearward facing third seat. Spare tire is hidden in the right rear fender panel.

Another Chrysler product, and one which can be bought—eventually—is the Plymouth Fury. Supposedly a high performance sports car, the Fury retains all deluxe conveniences. Its 240-hp V-8 engine has a 303-cu-in. displacement, and a 9.25:1 compression ratio. Gold anodized aluminum grille and special stainless steel wheel covers add a note of distinction.

Only a handful have been made so far, but for those who want sports car performance with passenger car comfort, the Fury will be available in '56.

## The Packard Predictor

Studebaker - Packard Corp. brought its futuristic push button experimental model to Chicago, too. Designed as a Packard, the Predictor points up some touches which may be along pretty quickly as designers keep pushing car roofs toward the pavement.

One item: Doors which extend into the roof. As the door opens, electrically operated swivel seats swing out while the roof portion of the door rolls back like a desk top.

Powerwise, the Predictor has a 310-plus hp V-8 engine with 374 cu-in. displacement.

## U. S. Auto Output

Passenger Only

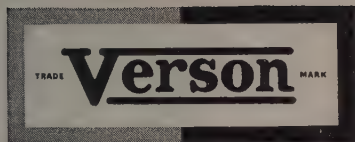
	1955	1954
January	659,719	456,765
February	675,769	443,257
March	794,188	526,076
April	754,007	533,470
May	724,891	494,250
June	649,372	504,811
July	659,979	441,451
August	614,392	436,650
September	461,592	285,860
October	517,669	236,635
November	748,559†	508,466
December		641,971
Total		5,518,662

Week Ended	1955	1954
Dec. 10	178,409	148,692
Dec. 17	169,256	151,924
Dec. 24	150,881	124,854
Dec. 31	105,670	124,250
	1956	1955
Jan. 7	122,919†	150,585
Jan. 14	144,000*	155,109

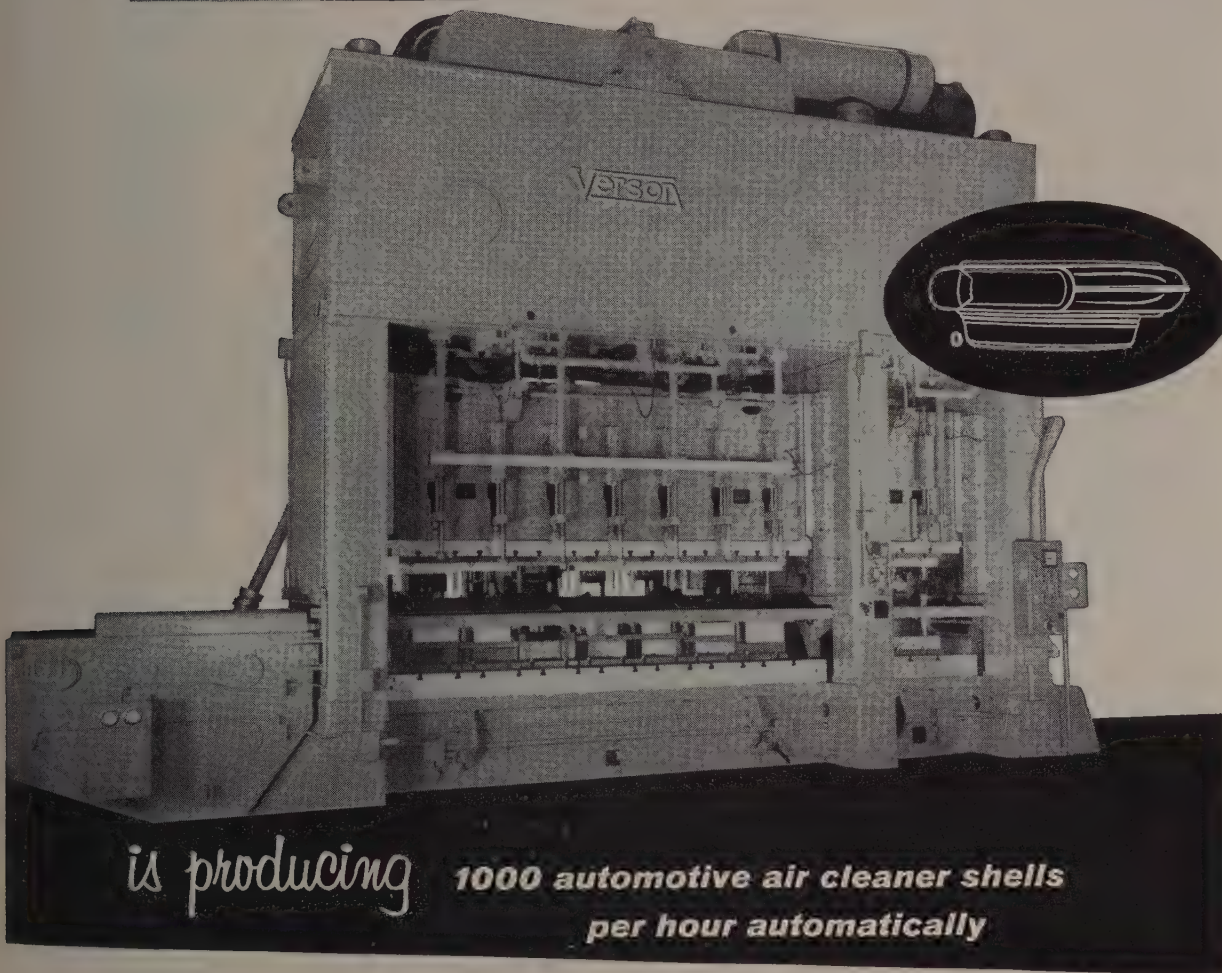
†Preliminary \*Estimated by STEEL  
Source: Ward's Automotive Reports



this



## TRANSMAT PRESS



*is producing 1000 automotive air cleaner shells  
per hour automatically*

In another cost cutting production process engineered by Verson, this 900-ton two-slide Transmat press completes 1000 air cleaner shells every hour without human handling. The intricate part is formed from coil stock in eight consecutive operations.

Verson Transmat Presses offer unusual economy and efficiency whenever four thousand or more pieces, requiring four or more operations, are produced per day. Essentially a single press with multiple die stations and separately adjustable slides, the Transmat transfers the work piece by mechani-

cal fingers synchronized with the press action. Feeding can be from coil stock or blanks. Intermediate handling, pickling or annealing is unnecessary.

The Verson Transmat is more than a press . . . it is a production process that can substantially reduce unit costs on a wide variety of mass produced stampings. Whatever your requirements, however — from several hundred to many thousand stampings per day — we will be happy to recommend the production process best suited to your needs. For specific recommendations, send an outline of your production problem.

*A Verson Press for every job from 60 tons up.*



ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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## *The fuel that sparked our nation's growth secures her greater future*

A young America—primed by a new and power-packed fuel—became a great industrial giant almost overnight. Coal had supplied the first unwavering spark which was to grow into the brightest productive flame the world has ever known.

After being served so well in the past and present, America looks again to dynamic coal for greater prosperity and security in the future. The vast Bituminous fields along the Baltimore & Ohio contain excellent coals in wide variety—available for centuries to come.

Highly mechanized mines, equipped and ready for any demands, will help maintain long-range cost stability. And improved utilization methods will meet the increased requirements of the future by providing greater coal-burning efficiency.

### **CALL ON OUR COAL TECHNICAL SERVICE**

You'll receive complete information from trained B&O experts about the kind and size of Bituminous coal that fits your needs best—at a price you want to pay. Write:

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BALTIMORE & OHIO RAILROAD  
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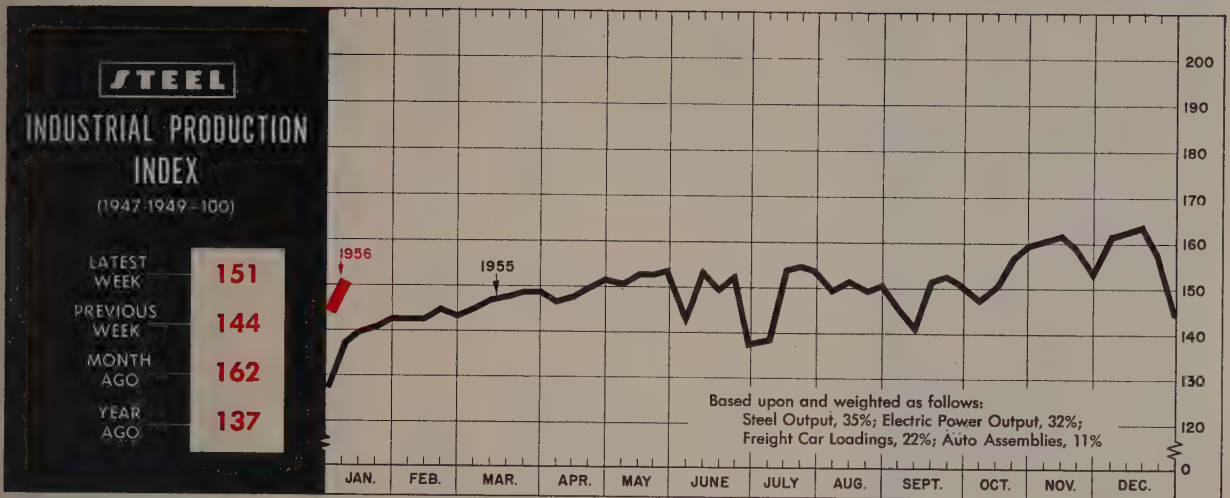
**BITUMINOUS COALS  
FOR EVERY PURPOSE**



# **Baltimore & Ohio Railroad**

**Constantly *doing things* — better !**





Week ended Jan. 7

## Auto Cutbacks Keep Business Guessing

AUTOMOTIVE output is being watched for clues to general business activity in 1956 even more than it was last year. In 1955 there was nothing but optimism over the industry's prospects; this year, industry spokesmen lack that bullishness.

Speaking before a meeting of representatives of major underwriting houses in New York, Henry Ford II said he was "reasonably sure" 1956 will not be so good as 1955 for Ford Motor Co. He joined a growing chorus of major automotive executives who view this new year with conservatism.

**Cutbacks**—Carrying over from December, the concern over increasing dealer stocks of new cars is resulting in cutbacks in production which could continue for several weeks. *Ward's Automotive Reports* says that dealers have a 33-day supply, or about 725,000 new cars. This compares with the 16.1-day supply at the turn of 1955. Even if a sales pickup should develop in January—and dealers say it is—production could still remain at comparatively low levels without doing too much harm.

Ford and Chrysler Corp. are leading the cutbacks. Ford will lay off 1657 hourly workers at its River Rouge plant during January and February as the company returns to a 40-hour week. The Mer-

cury Division, frankly admitting that demand is off, is also cutting output. In addition to long holidays over Christmas and New Year's, Chrysler pulled in on some of its divisional operations during the first week of January, reflecting the softening in the market. General Motors Corp. held to planned schedules. Despite current

slowdowns, this could be a 2-million-unit quarter, which by any standards other than 1955's would be terrific.

### Construction Eases Into 1956

Construction entered the new year with little more than casual notice after setting the second

### BAROMETERS OF BUSINESS

#### INDUSTRY

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
Steel Ingot Production (1000 net tons) <sup>2</sup>	2,388	2,403	2,007
Electric Power Distributed (million kw-hr)	11,400 <sup>1</sup>	10,751	9,425
Bitum. Coal Output (1000 tons)	9,100	10,280	7,430
Petroleum Production (daily avg—1000 bbl)	6,900	6,987	6,343
Construction Volume ( <i>ENR</i> —millions)	\$160.5	\$276.8	\$414.9
Auto, Truck Output, U. S., Canada ( <i>Ward's</i> )	147,474	122,118	177,877

#### TRADE

Freight Car Loadings (1000 cars)	550 <sup>1</sup>	575	602
Business Failures (Dun & Bradstreet)	185 <sup>1</sup>	174	198
Currency in Circulation (millions) <sup>3</sup>	\$31,152	\$31,415	\$30,434
Dept. Store Sales (changes from year ago) <sup>3</sup>	+11%	+22%	-1%

#### FINANCE

Bank Clearings (Dun & Bradstreet, millions)	\$22,862	\$18,909	\$22,957
Federal Gross Debt (billions)	\$280.8	\$280.7	\$278.8
Bond Volume, NYSE (millions)	\$16.9	\$14.9	\$31.2
Stocks Sales, NYSE (thousands of shares)	9,632	9,007	22,946
Loans and Investments (billions) <sup>4</sup>	\$86.7	\$86.8	\$86.5
U. S. Govt. Obligations Held (billions) <sup>4</sup>	\$30.1	\$30.3	\$36.9

#### PRICES

STEEL's Finished Steel Price Index <sup>5</sup>	208.90	208.90	194.53
STEEL's Nonferrous Metal Price Index <sup>6</sup>	273.2	270.1	215.8
All Commodities <sup>7</sup>	111.5	111.4	110.9
Commodities Other than Farm & Foods <sup>7</sup>	119.6	119.6	114.8

\*Dates on request. <sup>1</sup>Preliminary. <sup>2</sup>Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. <sup>3</sup>Federal Reserve Board. <sup>4</sup>Member banks, Federal Reserve System. <sup>5</sup>1935-1939=100. <sup>6</sup>1936-1939=100. <sup>7</sup>Bureau of Labor Statistics Index, 1947-1949=100



**SAVES \$900  
A WEEK**

## ...new **Cincinnati** Finishing System at **NuTone**

This automatic painting and baking system, designed by CINCINNATI for NuTone, Inc., world-famous manufacturer of door chimes, ventilating fans and kitchen hoods, has increased production, sharply slashed finishing costs and doubled capacity per square foot area. Paint consumption is reduced to from 35 to 50% of what was formerly required.

Add to this a substantial increase in production, and you realize the higher efficiency NuTone has achieved, while saving more than \$900 per week!

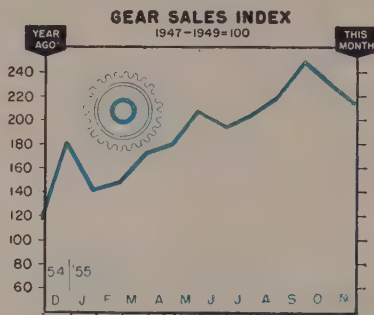
Let a CINCINNATI Cleaning and Finishing engineer take a look at your finishing costs. He'll give you a no-obligation analysis that can point to real savings for you.

**Write today!**

**Cincinnati**

**THE CINCINNATI CLEANING AND  
FINISHING MACHINERY COMPANY**

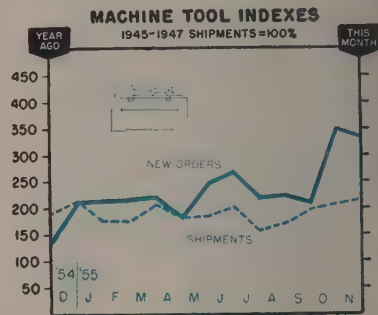
2019 Hageman St., Sharonville, Ohio, U.S.A.



	1955	1954	1953
Jan.	140.9	167.4	161.4
Feb.	148.5	165.1	188.1
Mar.	172.8	128.6	158.9
Apr.	179.8	158.2	217.1
May	205.2	132.5	189.8
June	193.5	127.4	146.5
July	201.7	141.3	120.7
Aug.	217.6	154.7	121.6
Sept.	246.5	135.1	135.6
Oct.	227.6	152.3	211.1
Nov.	210.4	116.7	144.9
Dec.	....	182.2	194.0

American Gear Mfrs. Assn.

Charts copyrighted, 1956, STEEL



	New Orders 1955	1954	Shipments 1955	1954
Jan.	203.0	173.5	167.3	319.4
Feb.	209.4	169.8	168.2	323.1
Mar.	214.6	169.6	202.5	327.2
Apr.	178.1	142.8	180.1	302.7
May	243.7	139.5	180.9	270.3
June	263.2	185.2	198.8	276.3
July	217.8	124.7	152.9	208.7
Aug.	221.3	147.9	164.6	203.7
Sept.	207.3	180.9	195.4	213.4
Oct.	347.1	148.9	204.2	181.0
Nov.	432.7*	119.5	214.6	179.5
Dec.	....	202.9	....	203.4

\*Preliminary  
National Machine Tool Builders' Assn.

highest monthly total for contracts in December. *Engineering News-Record* reports a total of \$1.693 billion worth of awards, second only to a \$2.4-billion month recorded in 1950, which included an atomic plant contract for almost \$1 billion. December's total was well above the November figure of \$1.369 billion, and ran the full-year tally up to a record \$18.7 billion, 30 per cent above last year. Public works led the way last month, with state and municipal contracts showing strength. Private work was off sharply on a weekly basis.

Because there were only four business days in the first week of January, the new year got off to a slow start. Heavy construction awards came to only \$160.5 million, well below both the previous week (only three days because of Christmas) and the full week a year ago.

The cost of construction is still on the upgrade. *Engineering News-Record's* construction cost index is at a record high of 676.36 (1913=100), mainly because of increased cement and lumber prices. Aberthaw Construction Co. says its index of the cost of industrial building advanced in the fourth quarter, 1955, from 399.4 to 400.7.

## Railroad Earnings Up

Railroads are reporting far better incomes through November, 1955, than for the corresponding period in 1954. Class I railroads in November had an estimated net income of \$80 million, compared with \$77 million in the 1954 month. Net income for the first 11 months of 1955 rose to \$830 million from \$562 million in the previous year. These earnings are reflected in loading of revenue freight cars for the full year of 1955 as tabulated by the Association of American Railroads. Last year saw an increase of 3,968,590 cars, or 11.7 per cent, over 1954. Even the last week of December, which included the Christmas holidays, showed an 8.6-per-cent increase over the corresponding week of 1954, which had no holiday.

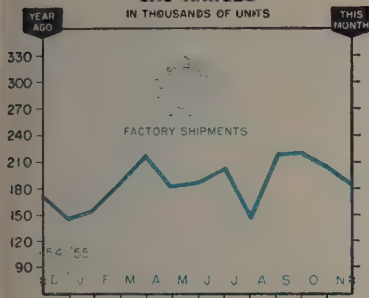
## Index Takes Holiday Dip

The net result of the holiday season was a decrease in STEEL's industrial production index to 144 (1947-1949=100) for the week ended Dec. 31, with an expected recovery to about 151 for the following week. The steel industry was the stabilizing factor, turning out 2,309,000 net tons of steel for in-



## GAS RANGES

IN THOUSANDS OF UNITS



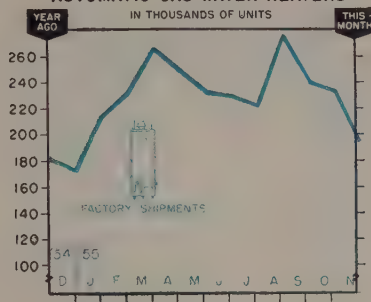
### Shipments—Units

	1955	1954	1953
Jan. ....	182,900	187,000	189,200
Feb. ....	186,200	182,900	185,900
Mar. ....	217,300	188,200	208,200
Apr. ....	182,300	172,400	220,300
May ....	187,400	163,800	181,000
June ....	203,900	174,300	186,900
July ....	145,700	184,500	159,900
Aug. ....	215,600	179,400	186,800
Sept. ....	217,700	203,900	209,500
Oct. ....	205,600*	197,100	203,900
Nov. ....	182,000*	174,000	158,500
Dec. ....	.....	147,300	134,400
Total ....	.....	2,024,800	2,183,300

\*Preliminary  
Gas Appliance Mfrs. Assn.

## AUTOMATIC GAS WATER HEATERS

IN THOUSANDS OF UNITS



### Shipments—Units

	1955	1954	1953
Jan. ....	210,900	184,400	189,900
Feb. ....	228,400	175,000	194,200
Mar. ....	263,100	187,800	207,400
Apr. ....	245,200	200,800	209,500
May ....	229,400	195,600	183,300
June ....	227,100	206,700	181,200
July ....	219,300	190,300	178,900
Aug. ....	275,600	207,100	188,100
Sept. ....	237,100	205,500	179,000
Oct. ....	231,200	202,000	194,300
Nov. ....	192,500*	179,100	155,000
Dec. ....	.....	166,800	141,900
Total ....	.....	2,281,100	2,182,700

\*Preliminary  
Gas Appliance Mfrs. Assn.

gots and castings during the former week and 2,403,000 net tons the latter. Estimated production for the week ended Jan. 15 was 2,388,000 net tons, according to the American Iron & Steel Institute. That is equal to 97 per cent of capacity. Electric output, which dipped during the holidays, still maintained a rate about 14 per cent above 1954's at the year end.

## PAs Look for Good Year

That business in general in 1956 is going to continue on a high plane is affirmed by the December survey of the Purchasing Agents Association of Chicago. Salient points: Deliveries of materials are getting faster than they were in November. But prices showed a marked increase in the "higher" category. Inventories remained about where they have been the last three months, but 65 per cent of the members said they were up as much as 100 per cent over a year ago. However, 78 per cent reported that their inventories were in about the proper relation to contemplated first-quarter, 1956, sales. The majority of PAs said that employment was the same as in November, while production continues a

three-month trend away from the "higher" bracket. About 56 per cent reported production on an even keel with the previous month. Backlogs remained the same for more purchasers in December than at any other time in the last half of 1955. Eighty per cent are sticking with the 30-90-day range on buying policies. All but 13 per cent said that business, from the standpoint of profit, is the same or better than it was in the preceding month.

## Income and Credit Rise

Personal income and credit spending remained at high levels near the close of 1955. The Office of Business Economics, U. S. Department of Commerce, reports that personal income in November was at an annual rate of \$311.5 billion, or about \$2 billion higher than in October. The bulk of the increase was in private industry wages and salary disbursements. The Federal Reserve Board said that installment credit rose \$284 million in November, but for the first time in 1955 automobile paper was not the main cause. Other consumer goods, such as refrigerators, ranges and appliances, were mainly responsible.

COOPER ALLOY

# CORPORATION BRIEFS

• Edited by GEORGE BLACK

## VALVE CLINICS

In spite of our belief that the Cooper Alloy stainless steel valve offers the best in design and operating features, we take it to school regularly. This "school" consists of continual study by field engineers, design engineers and by industry itself subjecting it to intensive examination and reporting their findings at organized Valve Clinics.

Cooper Alloy Valve Clinics have been held in dozens of leading plants, including Dow, DuPont, Mathieson, Celanese, Pfizer and many others. Arrangements for such a clinic in your own plant may be made through our Public Relations Division.



## "FLEX-ALLOY" STAINLESS PUMP

A new line of stainless steel rotory pumps for corrosive solutions, abrasive slurries and fluids which must be kept free from contamination has just been announced by our Vanton Pump & Equipment Division. Called "Flex-Alloy" these new pumps in type 304 or 316 stainless (other alloys on request) incorporate the same no-stuffing box, no-shaft seals, no-gasket features of the popular "flex-i-liner" plastic pump series. Full details are given in Bulletin VP561.

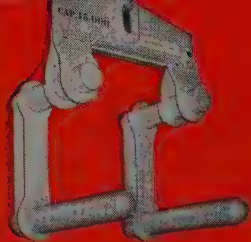


## FAST AND COLD

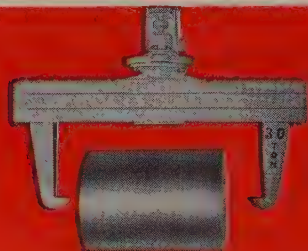
On October 14, 1947, the Bell X-1 made history by flashing through the skies faster than sound. Cooper Alloy is proud to have been teamed with the Glasby Company in helping Bell Aircraft carve its notch in history by furnishing the 30" diameter, 3" wall stainless steel sphere required for handling the liquid nitrogen.



COOPER ALLOY  
CORPORATION - HILLSIDE, N.J.



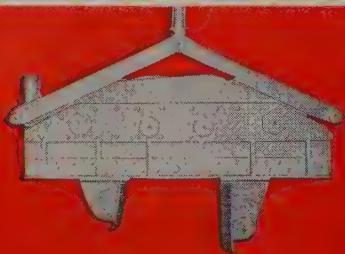
DOUBLE "C" HOOK



MOTORIZED ROTATING HORIZONTAL COIL TONG



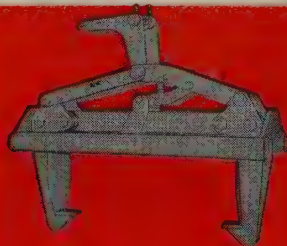
SINGLE VERTICAL COIL TONG



DOUBLE VERTICAL COIL TONG



MOTORIZED NON-ROTATING HORIZONTAL COIL TONG



Engineered for your  
Coil Handling Jobs

**HEPPENSTALL**

AUTOMATIC AND MOTORIZED

**SAFE-T-TONGS**

Coil handling problems differ from one plant to another. And Heppenstall's Safe-T-Tongs are designed to fit each set of specific requirements . . . yours for instance.

Heppenstall's Safe-T-Tongs (for coils) are lifting steel strip weighing up to 35 tons per coil—safely and economically. They are designed to lift coils vertically or horizontally—or grasp coils circumferentially as required.

Heppenstall Safe-T-Tongs for coil handling jobs have stepped up efficiency—lowered overall costs—decreased damage to coils—and improved safety conditions in plant after plant. They'll do the same for you.

Our engineers would like to work with you in designing tongs to meet *your* specific requirements. Write us today.



You'll want this new catalog. It contains solutions to many materials handling problems. We'll be pleased to send you a copy. Address: Heppenstall Company, Pittsburgh 1, Pa.

TONGS TO LIFT  
COIL HORIZONTAL  
AROUND O.D.



SINGLE  
"C" HOOK



**Heppenstall**

tongs for every lifting problem





**BERNARD L. JONES**  
... Crucible Steel chief engineer

Bernard L. Jones fills the new position of chief engineer at Crucible Steel Co. of America, Pittsburgh. Tore Wallin was named assistant chief engineer. Mr. Jones joined Crucible in 1950 and since 1953 has served in engineering planning and development.

Bridgeport Brass Co., Bridgeport, Conn., appointed Irving M. Malsch general sales manager; John C. Miller sales manager, mill products; and Col. Orson A. Kinney, manager of defense sales.

Paul E. Kelly was made assistant sales manager, Alloy Tube Division, Carpenter Steel Co., at Union, N. J. He was eastern regional sales manager.

Martin C. Falk joined Yoder Co., Cleveland, as chief research engineer. He was with Warren Steel Division, Copperweld Steel Corp.

Peter B. McSherry Jr. was promoted to sales manager, Socket Screw Division, Bristol Co., Waterbury, Conn. He was assistant sales manager.

Paul C. Meyer was elected a vice president of Henry J. Kaiser Co., Oakland, Calif., responsible for administrative activities of Kaiser Engineers Division and its subsidiaries. He was vice president-administration at Kaiser Metal Products Inc., Bristol, Pa.



**W. SHERIDAN HUSS**  
... heads Acme Steel Products

W. Sheridan Huss was elected president of Acme Steel Products Division, Acme Steel Co., Chicago. He succeeds John G. Bucuss who continues in an advisory capacity. Mr. Huss was vice president and general sales manager of the division.

Franklin A. Regener was made sales manager, Variety Stamping Corp., Cleveland.

F. D. Weatherholt was made manager of Westinghouse Electric Corp.'s gearing division, Pittsburgh, to succeed L. R. Botsai, now assistant to the vice president. Mr. Weatherholt was sales manager, apparatus products. Mr. Botsai is located at the gearing division and will act in an advisory capacity to Mr. Weatherholt.

John N. Miller joined Jessop Steel Co., Washington, Pa., as assistant to the president, responsible for production planning. He was general manager of production at Universal-Cyclops Steel Corp.

Robert E. Wilkin, vice president-general sales manager, Hooker Electrochemical Co., Niagara Falls, N. Y., was elected vice president and director of sales.

W. H. Oliver succeeds Phillips B. White, retired, as manager of American Radiator & Standard Sanitary Corp.'s Bond plant in Buffalo.



**WILLIAM B. PIERCE**  
... Allegheny Ludlum v. p.-sales

William B. Pierce was elected vice president-sales, Allegheny Ludlum Steel Corp., Pittsburgh. Formerly vice president-technical director, he succeeds Russell M. Allen who continues as vice president and a director. Dr. Gunther Mohling was made chief metallurgist to replace Dr. Rush Lincoln, now technical director. Dr. Mohling is at Brackenridge, Pa. He is replaced as manager of quality control, Watervliet, N. Y., plant by W. W. Dyrkacz. Dr. E. E. Reynolds succeeds Mr. Dyrkacz as associate director of research.

Titan Metal Mfg. Co., Bellefonte, Pa., named Grey W. Tressler vice president-manufacturing; Marvin J. Rothrock, vice president and director of purchases; Ralph H. Lightner, vice president-sales manager; H. Chapman Ward, vice president-cost controller; and W. E. Dunnick, works manager.

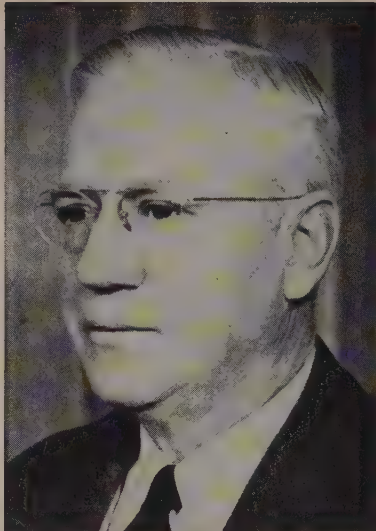
Leo F. Givens was elected controller, Rheem Mfg. Co., Richmond, Calif., to succeed C. B. Huestis, resigned.

Hill E. Nelson was appointed Detroit regional manager, National Automatic Tool Co.

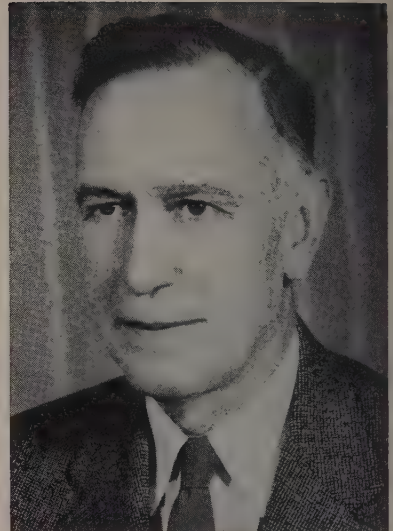
Ralph W. Rawson joined Fansteel Metallurgical Corp., North Chicago, Ill., as chief engineer in charge of the newly established centralized engineering department. James A.



A. G. PATTERSON



ALVIN C. DYER



DR. JOHN D. LEITCH

... Square D and Electric Controller & Mfg. Division positions

Myers was made field sales engineer, rectifier-capacitor division, at Cleveland.

Lewis J. Langeness was made sales manager of Wilshire Power Sweeper Co., Elgin, Ill. He is replaced by Louis Wieringa as central district manager.

William S. Brown was named vice president-sales manager, Lincoln-Schlueter Floor Surfacing Machine Co., Toledo, O.

P. D. Shollar and J. F. Haley were appointed departmental vice presidents of Koppers Co. Inc., Pittsburgh. Mr. Shollar manages the procurement department; Mr. Haley the traffic and transportation department.

Crucible Steel Co. of America appointed Robert L. Felt assistant chief metallurgist at its Midland, Pa., Works.

Richard B. Fuller joined Thompson Products Inc., Cleveland, as associate director of purchases. He was with the Buffalo division of American Machine & Foundry Co., serving as assistant works manager.

C. S. Wagner was made sales manager, merchant trade products, Northwestern Steel & Wire Co., Sterling, Ill. He succeeds the late Robert J. Kay.

Jack C. Lucas was elected executive vice president of Ross-Meehan Foundries, Chattanooga, Tenn.

A. G. Patterson was named president and F. W. Magin chairman of Square D Co., Detroit, following merger of Electric Controller & Mfg. Co., Cleveland, as a separate division. Mr. Patterson was president of Electric Controller and Mr. Magin was chief operating officer of Square D. Alvin C. Dyer and Dr. John D. Leitch, former vice presidents of Electric Controller, were named to similar posts in the merged company. Mr. Dyer will serve as vice president and general manager of the Cleveland division. Dr. Leitch, at Detroit, will co-ordinate engineering activity for Square D plants in the U. S., Toronto and Mexico City.

Fred Stricker was made manager, canseal department, Cannon Electric Co., Los Angeles. He replaces Wes Speer, resigned.

Robert Cushman was made assistant to the sales manager, grinding wheels, at Norton Co., Worcester, Mass. He was West Coast district manager and is succeeded by Harry G. Brustlin. Donald F. Jones was made Pittsburgh district manager to succeed C. B. Price, retired.

Ralph L. Weisbeck was made works manager of Chisholm-Ryder Corp., Niagara Falls, N. Y. He was vice president-engineering and manufacturing for Wales-Strippit Corp.

C. F. Lausten was made general manager-equipment division and R. B. Thompson general manager-gen-

eral manufacturing department of American Can Co., New York.

Harold E. Whiteley was elected a vice president of Geuder, Paeschke & Frey Co., Milwaukee. He is in charge of manufacturing operations. Robert C. Colyer was promoted to assistant general sales manager; Robert C. Gehlhaart, to assistant to the general sales manager; Bonner Hoffmann, to controller; and Neil E. Geisler, to superintendent of the Lebanon, Ind., plant. Howard Mayer was made chief production engineer and Joseph F. Harmon chief tool engineer.

William L. Tanksley, formerly factory engineer, light metals division, Thompson Products Inc., was made chief engineer of David Round & Son Inc., Cleveland. J. B. Fisher was named manager, special products division; and Louis E. Fanchally, director of purchases.

Elgin National Watch Co., Elgin, Ill., appointed W. H. Baudouine abrasives division sales manager.

Adrian D. Thompson was promoted from eastern district sales manager to manager of jobber sales for Nutting Truck & Caster Co., Faribault, Minn. He succeeds M. A. Larson, now in charge of the Des Moines sales office.

Dr. Richard N. Rhoda was made head of the platinum metals section of International Nickel Co.'s



# SHOPPING CENTER TEXAS STYLE... **BIG**



**GULFGATE SHOPPING CITY**, Houston, Texas. *Architect: John Graham and Company, Seattle*  
*Contractor: Farnsworth and Chambers.*

## **840,000 SQUARE FEET OF SPACE!**

Gulfgate Shopping City near Houston, established by Allied Stores Corp., is like most things in Texas . . . big. The \$20,000,000 project will house 90 to 100 stores, including Joske's department store with 207,000 square feet of space. Overall, there are 840,000 square feet, facilities to park 20,000 automobiles a day. Fabricated steel for this gigantic, modern development was furnished by Ingalls.

**FABRICATING  
STEEL IS OUR  
BUSINESS!**



**IRON WORKS COMPANY**  
**BIRMINGHAM, ALABAMA**

*Sales Offices: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans*

*Plants: Birmingham, Ala.; Verona, Pa.; Pascagoula, Miss.; North Birmingham, Ala.  
Decatur, Ala.*



**HAROLD A. STIPEK**  
... Stanley Wks. steel div. supt.

research laboratory at Bayonne, N. J. He succeeds Ralph H. Atkinson, retired.

**Harold A. Stipek** was named superintendent, steel division, the Stanley Works, New Britain, Conn. He replaces **Russell C. Germond**, retired. Since 1954, Mr. Stipek has been on special assignments as an engineer of the steel division, assisting in development of plans for the steel expansion program.

**Kling Bros. Engineering Works**, Chicago, appointed **Joseph M. Dorocke** general sales manager.

**R. G. Altizer** was appointed assistant to the president, **Magnus Metal Corp.**, subsidiary of **National Lead Co.**, New York. **Ralph D. Baker** was named eastern sales manager, succeeding **J. E. Brown**, who now serves as consultant. **Charles V. Kinsley** was made district sales manager for New York and New England.



**CLAUDE L. BORING**  
... gen. mgr. at Erie Foundry

**Claude L. Boring** was made general manager, **Erie Foundry Co.**, Erie, Pa. He joined the company a year ago as assistant to the president. He formerly was division vice president of **Plomb Tool Co.**

**George C. Brecht** was made general manager-sales, **Greenville Steel Car Co.**, Greenville, Pa. **John T. Egbert Jr.** was made assistant to the general sales manager. **William A. Bright Jr.** was made sales manager, **Ateco Division**.

**Marvin W. Marshall** was made director of automotive sales for **Pittsburgh Plate Glass Co.**, Pittsburgh.

**Winnard E. Karr** was made chief engineer, **Fawick Airflex Division**, **Fawick Corp.**, Cleveland.

**W. F. Kuehne** succeeds **Robert MacMinn**, retired, as Chicago district contracting manager of fabricated steel construction, **Bethlehem Steel Co.**



**A. J. DeWOLF**  
... president of Dreis & Krump

**A. J. DeWolf** was elected president and treasurer, **Dreis & Krump Mfg. Co.**, Chicago. He succeeds the late **Walter H. Dreis**. Mr. DeWolf was vice president-general sales manager. Other elections: **Edward J. Dreis**, first vice president; **Matt Krump**, second vice president; **Gart Winkler**, secretary; and **Margaret Freidhof**, assistant secretary.

**J. D. Douglas** was made a vice president of **Electro Metallurgical Co.**, division of **Union Carbide & Carbon Corp.**, New York.

**Howard R. Swartz** and **Frank L. Sonneman** were made assistants to the president of **Pittsburgh Screw & Bolt Corp.**, Pittsburgh. Mr. Swartz recently resigned as general sales manager of **Cleveland Cap Screw Co.** Mr. Sonneman, who resigned as general manager, bolt and nut division, **Murray Corp.**, is in charge of manufacturing at **Pittsburgh Screw & Bolt**.

## OBITUARIES...

**Frank I. Schmeller**, 59, president, **Schmeller Aluminum Foundry Co.**, Cleveland, died Jan. 6.

**Charles J. Williams**, president, **Moore Pipe & Sprinkler Co.**, Jacksonville, Fla., and **Vancouver Steel Foundry Co.**, Vancouver, Wash., and chairman of **Moore Dry Kiln Co.**, died Jan. 3.

**Andrew Smith**, 61, production man-

ager, **Kobe Inc.**, Los Angeles, died Jan. 2.

**Harold V. Trask**, 40, chief metallurgist of the Cleveland office of **Cleveland-Cliffs Iron Co.**, died Dec. 23.

**Cecil R. Parry**, 49, vice president, **Rich Mfg. Co.**, Elizabeth, N. J., died Jan. 2.

**Joseph L. Cromer**, 61, vice president and manager of the New

York office of **William Powell Co.**, died Dec. 31.

**Alex F. Mack**, 43, eastern representative, **Thomas Machine Mfg. Co.**, Pittsburgh, died Dec. 30.

**Mandel Lowenstine**, 73, president, **Central Steel & Wire Co.**, Chicago, died Jan. 3.

**R. P. Hutchinson**, 73, chairman of **Bethlehem Fabricators Inc.**, Bethlehem, Pa., died Jan. 7.



# These days **WISE MEN** are talking savings

## IN ELECTRIC FURNACES



"The Whiting Hydro-Arc Furnace has real cost-saving advantages."



"Uni-directional electrode motors . . . no reversing."



"Arc regulation to a fixed standard."



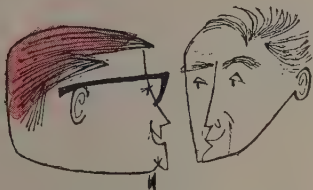
"Electrode motors driven directly from arc-furnace bus without extra machinery."



"Regulated watt-input or heat-input to furnace. More efficient utilization of power input."



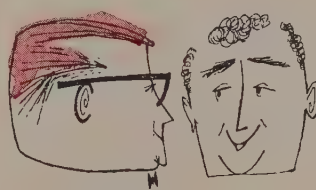
"Installation costs are lower—all these factors lead to better control and lowest cost per ton of melt."



"Only a few years ago, such electrode speed, acceleration and response were considered impossible."



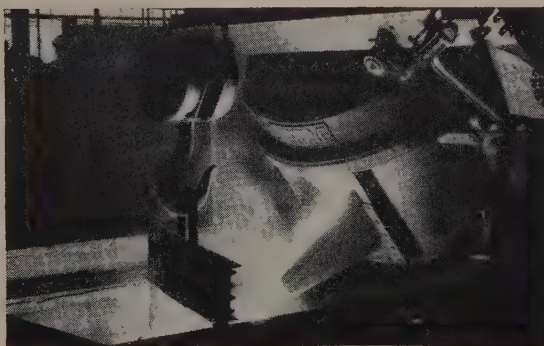
"The least number of moving parts."



"Electrode consumption and refractory costs are lower."



"Let's send for the Whiting Arc Furnace Bulletin FY-168 . . . it gives all the facts!"



**WHITING CORPORATION**

15643 Lathrop Avenue, Harvey, Illinois

# Buys Watson Flagg

General Electric forms gear motor and transmission component department following purchase

PURCHASE of "substantially all" the assets of Watson Flagg Machine Co., Paterson, N. J., has been consummated by General Electric Co., Schenectady, N. Y.

H. A. MacKinnon, GE vice president, also announced the formation of a gear motor and transmission component department with headquarters in the Watson Flagg plant in Paterson.

Watson Flagg has supplied gear motor components to General Electric for a long time. Formation of the new department will permit consolidation of the entire gear motor business of General Electric, Mr. MacKinnon said. He added that "except for a few additions and changes in the management areas, the plant is now and will be operated by substantially the same personnel employed by the Watson Flagg Machine Co."

General Manager — Lewis J. Burger has been named general manager of the new department, which is part of GE's Component Products Division with headquarters in Ft. Wayne, Ind. Mr. MacKinnon is general manager of the division.

John H. Flagg, president of the Watson Flagg firm, is being retained as consultant to the general manager of the newly formed department.

## Republic Unites Two Divisions

Bolt & Nut Division and the Chain Division of Republic Steel Corp., Cleveland, combined into a single new division known as the Bolt & Chain Division. It has its own sales organization. Operations of the division are under the direction of H. C. Seifert, division manager, who had headed the two divisions when they operated separately. H. A. Craig is general manager of sales for the new division. Norman W. Foy is vice president in charge of sales for the corporation. In addition to fastener and chain products, the division will handle tool steel and cold-formed parts sales.

Assisting Mr. Craig are assistant general sales managers: W. C. Schnackel, hardware, mill supply and distributor sales; H. D. Burdick, automotive, original equipment manufacturers and farm implement sales; J. K. Bole Jr., industrial, railroad, mine and contractor sales; R. C. Klemm, who will act in a liaison capacity with customers.

## Van Norman Buys Firm

Van Norman Industries Inc., Springfield, Mass., acquired H. W. Butterworth & Sons Co., Bethayres (Trenton), N. J., maker of washing, dyeing, bleaching, mercerizing and embossing machinery for the textile and rayon industries.

## Plans Screw and Bolt Plant

National Lock Co., hardware manufacturing subsidiary of Keystone Steel & Wire Co., Peoria, Ill., will build a \$5-million screw and bolt manufacturing plant on the outskirts of Rockford, Ill. It will contain about 600,000 sq ft of floor space and will increase the company's total to 1.6 million sq ft. Removal of the screw manufacturing activities from the present plant will make it possible to relocate other departments for better work flow and more economical operation.

## Installs Two Kilns

Firing of ferrites for electronic applications requires protective controlled atmosphere and rigid temperature control. Western Electric Co., New York, recently installed two slab tunnel kilns at its Hawthorne Works, Chicago. They were designed and built by the Kiln Division of Lindberg Engineering Co., Chicago.

## Flightex Joins Madison Group

Flightex Fabrics Inc., Providence, R. I., purchased Faessler Tool Co., Moberly, Mo., manufacturer of roller-burnishing tools, boiler and refinery tube expanders, and will operate it as one of its subsidiaries under the name of Madison-Faessler Tool Co. It becomes part of the Madison organization. Other associated firms in

the organization are: Madison Mfg. Co., Muskegon, Mich., producer of boring and reaming tools; Madison Industries Inc., Big Rapids, Mich., maker of deep hole and precision drills, trepanning tools and adjustable bore gauges.

## Continental Made a Division

Youngstown Sheet & Tube Co. has made its wholly owned subsidiary, Continental Supply Co., Dallas, a division of the parent company.

## Brake Shoe Forms New Firm

American Brake Shoe Co., New York, and F. H. Lloyd & Co. Ltd. of England will form a company to manufacture precision ferrous castings in the United Kingdom. Its chief function will be the production of castings for jet planes and tire molds. Bernard G. Drummond has been appointed director of Brake Shoe's Overseas Operations, a new department created to expand foreign activities through licensing arrangements and joint ownership of overseas operating companies.

## Plans New Plant for Waltham

Baldwin - Lima - Hamilton Corp., Philadelphia, will construct a manufacturing plant at Waltham, Mass. Containing 102,000 sq ft of floor space, it will house a newly organized Electronics & Instruments Division. J. R. Martin is vice president in charge of the division operation. Waltham also will be headquarters for engineering, sales and service of Baldwin testing machines.

## Koppers Plans Big Expansion

Koppers Co. Inc., Pittsburgh will spend \$25 million this year to expand and improve facilities and build plants. This is part of a five-year program launched last year. In 1955, Koppers bought six companies and 80 per cent of the common stock of Durethane Corp., Chicago. It also purchased all the government-owned facilities adjacent to its Kobuta, Pa., plant including butadiene units, a steam and power producing plant and coal-handling facilities.



## Solar Buys Fabricating Firm

Solar Steel Corp., Cleveland, steel warehouse and processing organization, purchased United Pipe Column & Railing Co., Norristown, Pa. Operations of United Pipe in the fabrication of structural columns, railings and miscellaneous iron fabricated products will be continued as a division of Solar Steel. Roy Epner is plant manager of this new division.

## Pressed Metals Changes Hands

A group of businessmen and industrialists headed by Frederick W. Richmond, New York financier, acquired Pressed Metals of America Inc., Port Huron, Mich., manufacturer of automotive suspension parts. Officers of the new company (its name was not changed), include: J. W. Leighton, chairman of the board; J. D. Leighton, president; A. D. Patterson, vice president for finance; W. P. Carson, secretary; and Floyd G. Lock, treasurer. An expansion and product diversification program will be launched.

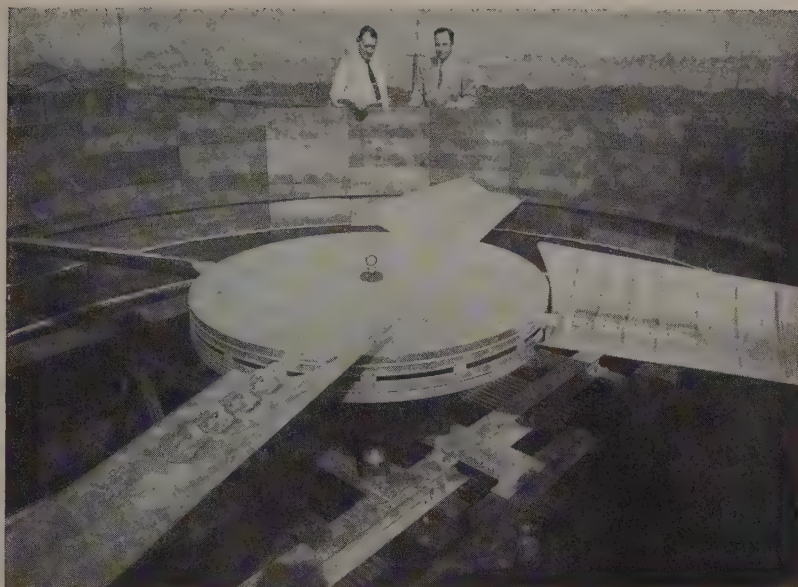
## NEW ADDRESSES

Sid Tool Co. Inc. moved to larger quarters at 158 Lafayette St., New York 13, N. Y. The firm sells special taps, drills, milling cutters and other cutting tools.

Walter Kidde & Co. of Canada Ltd. moved to 5500 Royalmount Ave., Mt. Royal, Montreal 9, Que. The company sells fire extinguishing equipment, fire detection devices, burglar alarm equipment and pneumatic aviation accessories.

Reynolds Metals Co., Louisville, moved its Miami, Fla., divisional office to the Aimsley building, that city.

T. J. Cope Inc. and its division, Instro Corp., moved manufacturing operations from Philadelphia to Collegeville, Pa. The new plant will double production facilities. Sales and executive offices will be moved to Collegeville in April. The firm's chief product is expanded



## Columbia-Geneva Mill Improves Water Cooling System

New equipment at the Torrance, Calif., Works of U. S. Steel Corp.'s Columbia-Geneva Steel Division conserves about 90,000 gal. of water daily in operation of the plant's circulating system. The cooling tower makes possible the re-use of 96 per cent of the water circulated. Two huge fans at the top of the tower create an air stream which cools the water as it flows at 7000 gpm. Each fan is 18 ft in diameter, has four stainless steel blades and is driven by a 60-hp motor

metal trough to support power cables and instrument tubing.



## ASSOCIATIONS

New officers of the Institute of Scrap Iron & Steel Inc., Washington, are: President, L. H. Krieger, Southwest Steel Corp., Pittsburgh; vice president, M. L. Chase, Luntz Iron & Steel Co., Canton, O.; second vice president, M. K. Mahler, Morrow Steel Co., Detroit; treasurer, E. J. Moskowitz, Schiavone Bonomo Corp., Jersey City, N. J.; secretary, Harry Marley, Abe Cooper-Syracuse Inc., Syracuse, N. Y. Edwin C. Barringer was re-elected executive vice president, and Samuel G. Keywell, treasurer emeritus.

William S. Story was appointed director of public relations of the institute.

James L. Hastie was appointed executive secretary, New York Tool & Die Institute. The organization recently moved its headquarters to 20-20 Steinway St., Long Island City 5, N. Y.

H. T. Hallowell Jr., president, Standard Pressed Steel Co., Jenkintown, Pa., was elected president of the American Standards Association, New York. Van H. Lechlitter, vice president of operations, American Steel & Wire Division, United States Steel Corp., Cleveland, was elected vice president.



## REPRESENTATIVES

White Metal Rolling & Stamping Corp., producer of wrought magnesium products, appointed Christiansen Corp., Chicago, as its sales representative in that territory.

Morris Machine Works, Baldwinville, N. Y., manufacturer of heavy-duty slurry pumps, named Cross Pump & Equipment Co., Charleston, W. Va., as its representative in that territory.

Republic Steel Corp.'s Berger Division, Canton, O., appointed Amana Products Corp., Long Island City, N. Y., as distributors of its steel kitchens in the New York city market area.



# "It Really Made Me THINK!"

"The other day when the Detrex man was in to see me, he dropped a couple pieces of information that really made me stop and think. The first thing he pointed out was that metalworking and surface preparation account for  $\frac{1}{4}$  to  $\frac{1}{3}$  of all the operations in the average metalworking plant. That started the gears rolling. If this was true in our plant, here was a good spot to realize some important dollar savings.

"Well, after finding that 30% of our operations were in metal cleaning and surface preparation, I knew

this was the spot to cut some costs . . . and no better way to start than by talking to a technician from Detrex. After all, they make a complete line of chemicals for metal cleaning and surface preparation—as well as the equipment too.

"To make a long story short, the Detrex technician surveyed our plant and came up with several cost-cutting suggestions that were pretty important to us. You know, I bet he could do the same thing for you in your plant. You don't even have to take the time to make the survey. I found out he will do

it for you and it won't cost you a cent. Most likely you, too, will realize some important savings as a result of the survey. Talk to the Detrex technician about it the next time he calls, or write direct to their main office if you wish."

*Service with a Saving!*



## DETREX CORP.

Dept. 601 • Box 501 • Detroit 32, Mich.

DEGREASERS • DEGREASING SOLVENTS • WASHERS  
ALKALI & EMULSION CLEANERS • DRYCLEANING  
EQUIPMENT • PHOSPHATE COATING PROCESSES

### Phosphate Coating

Detrex zinc phosphate coatings provide a permanent, rust-resisting surface and at the same time bonds the paint finish to the metal. Paint peeling and flaking are retarded, corrosion from moisture is prevented. Phosphate coatings can be economically applied by either immersion or spray methods.

### Emulsion Cleaners

Detrex emulsions clean metal and retard rust in one operation. Once metal parts have been cleaned with Detrex Emulsion Cleaners rust will not attack them. Because they will not attack any known metal or alloy, Detrex Emulsion Cleaners offer greater flexibility. Temperatures, concentrates and chemicals can be tailored to your specific cleaning needs.

### Degreasing Solvent

Detrex Perm-A-Clor has superior stability and resists break-down into sludge or corrosive acid. Thus, Perm-A-Clor assures trouble-free, continuous production. Eliminates costly shut-downs for replacement of spoiled solvent, clean-out of sludge and neutralizing of cleaning equipment.



# Technical Outlook

**GROWING**—Use of polyester resins in reinforced plastics increased about 80 per cent last year over 1954—from 27 million to an estimated 49 million lb, reports the Society of the Plastics Industry. Production was speeded up by the use of matched metal molding in making reinforced plastics parts and preforming—pulling a number of new companies into the business. Over-all, the plastics industry made about 3.6 billion lb of raw materials last year. This is a 30-per-cent increase over 1954's 2.82 billion lb.

**NOW WATER**—Except for its rusting and poor wetting qualities, water would have been used long ago as a fluid base for magnetic particle inspection. A suitable wetting agent and rust inhibitor have been found. Advantages: No fire hazard, nonirritating to skin, reduced cost.

**SHOTGUN TEST**—To test its new resin lenses for safety goggles, Armorlite Lens Co., Pasadena, Calif., took them to a shooting range. Spectacles with glass in one side and hard resin in the other were the target for a 16-gage shotgun. At 40 yards the resin lens cracked (but didn't shatter); the glass was blown out. At 45 yards the resin lens remained perfect; the glass was blown out. Armorlite lenses, made from allyl diglycol carbonate plastic are cast between dies under ascending temperatures and pressures until they set hard.

**COMPUTING THE GRIND**—Electronic computing equipment has been linked with a punch card system to calculate formulas for all grinding wheels made by Bay State Abrasive Products Co. This turns a day's work into seconds, eliminates human error and assures the customer that all orders will be formulated exactly to his specification. Bay State management prophesies that in the near future computing

systems will be combined with manufacturing processes to guide the selecting, measuring, combining and processing of all grinding wheel ingredients.

**REMOTE WEIGHING**—The bugs are out of remote, digital weight recording, says Toledo Scale Co. An electronic unit transmits weights to tabulating card punches, adding machines or other data-handling devices. The electrical or mechanical errors that dogged earlier attempts at remote reading are avoided, the company says.

**BETTER TENSILE TEST**— Metallurgists at Westinghouse have what they call "a much more realistic picture of the behavior of metals." Instead of measuring rupture force and per cent of elongation, they measure the necking dimensions electrically *during the test*. The measuring device doesn't interfere with the test in any way. Stress-strain curves obtained from necking dimensions tell more than the old method about heat treatment, chemistry and mechanical working; such curves accurately predict behavior in forming operations.

**FLASHPROOF**—A 304 stainless faucet is being manufactured with a protective corrosion-resistant, antflash screen in the nozzle made of Kel-F plastic. It will be used with volatile and inflammable solvents. Safety comes from the elimination of all metal-to-metal contact in the operation of the valve.

**WIDER MAGNESIUM**—Dow says it is rolling magnesium sheet 0.064-in. thick and thicker in widths up to 72 in. Sheet 0.040 and 0.051-in. thick is available in widths up to 60 in. Maximum width for all gages had been 48 in.

## How To Fight Fatigue Failure

- Eliminate sharp changes of cross section, notches, grooves, keyways, holes, etc., which serve as stress raisers
- Where it is difficult to reduce stress-concentration factors and where regions of abrupt changes in area occur, the surfaces should be well polished and all corners dressed. Use generous fillet radii
- Since fatigue failure usually starts near the surface, improved surface conditions, such as better machining, honing, wire brushing "superfinishing"—any treatment that gives a better microinch finish—will help fatigue life
- Avoid sharp surface tears from rough machining, stamping, shearing, etc.
- Use an electroplated coating that has a residual compressive rather than a residual tensile stress. Heavy nickel plate under compression is being used to protect aircraft parts from fatigue
- Shot peening creates a residual compressive stress in the surface layer of a part. Fatigue cracks are less likely to start
- Adhesives used to join sheet metal parts (in addition to rivets and other fasteners) defeat fatigue in high-speed aircraft by distributing stresses. Rivets are stress raisers when used in parts subject to intense vibration. Fatigue life of rivets, plus adhesive, is double that of rivets alone
- Identification numbers stamped on parts may cause failure if put in highly stressed areas
- Examine fabrication method—For example: Fittings made from cored forgings show five times the fatigue endurance of parts from standard forgings or extrusions. Cold rolling and cold drawing are fatigue favorable. Moderate cold working will raise the endurance limit of most metals
- Avoid shop carelessness in fabrication. A deep gouge caused by a hammer or screw driver that is uncorrected can be a source of trouble. Dragging a part over a hard surface, such as a chip or nail in a cart, or pulling it across the floor may make harmful surface imperfections
- Harder outer surface resulting from case carburizing, nitriding, flame and induction hardening improves fatigue life for conditions of uniform stress. It may reduce some of the weakening effects of fillets, oil holes and other discontinuities
- Surface decarburization during processing should be prevented
- Straightening of parts after hardening may impair fatigue strength
- Stress relief-annealing and any treatment which cuts down on internal stresses helps fatigue
- Small parts, generally, have a longer fatigue life than large ones of the same material
- Make parts from clean homogeneous metal free from inclusions and voids. Vacuum melted superalloys are clean and give improved high temperature fatigue strength
- Parts made from fine-grain alloys are better fatigueswise than when made from coarse grain metal
- Surface of parts should be protected against corrosion during service
- Fretting damage (and fretting corrosion) leads to fatigue failure. Pay particular attention to favorable residual stresses in surfaces of shafts, etc.
- Notch sensitive materials should be avoided in tension members where fatigue life is an important factor

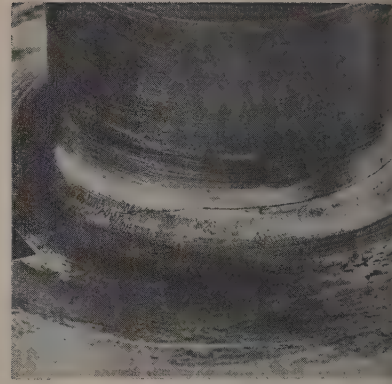


Fig. 1—Fatigue crack in the forged-steel shaft of a punch press

## What You . . .

THE NEED to use metals nearer the limits of their abilities—to save weight and money—is causing more worry about fatigue failure in service.

Metal fatigue (a metal will easily stand a certain stress when it is new but eventually will break when the same stress is applied repeatedly) accounts for at least 80 per cent of the operating failures in machine parts.

Some Reasons—Today, there's more mechanization in every field. More emphasis is being placed on the high strength-weight ratio of equipment running at high speeds. Efficient design requires the size and weight of all parts—gears, shafts, connecting rods, etc.—to

### POST MORTEM

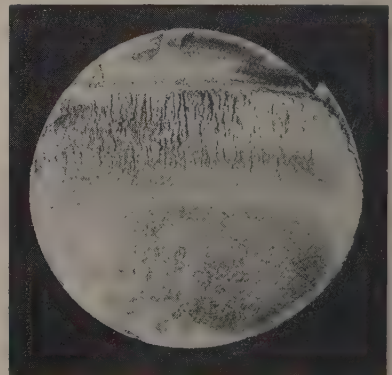


Fig. 3—End view of fracture shown in Fig. 1. Crack started at fillet, progressed through shaft





Fig. 2—Torsional fatigue failure of a shaft. Crack started at a sharp fillet at a change in section, progressed to weaken the section until it twisted off

# Can Do About Metal Fatigue

By DR. ALLEN G. GRAY  
Technical Editor

be cut down. This means higher operating stresses.

There are good reasons then why fatigue failure is becoming more of a worry point.

What can you do about it? The box (left) gives the precautionary measures you can take.

**Two Areas**—Fabrication and design are the areas to watch. You can make a lot more progress against fatigue by examining these operations than by changing to a higher strength metal—if what you're using is sound and free from defects. For parts plagued by severe stress raisers, little help can be expected by going to a higher strength metal.

Keep this in mind: Fatigue

failures almost always start at an irregularity in the surface.

Surface blemishes on parts may be due to processing. Careless handling can cause nicks, gouges, scratches, etc. Or the designer may specify an irregular contour for a functional reason.

**Always Good**—A good microinch finish on all parts where fatigue life is important is a good investment. Engineers are calling for a finish finer than that of the best outside trim on some internal working parts of an automobile (such as automatic transmission gears).

Shot peening strengthens the surface of parts. It reduces the effect of notches—fatigue cracks are less likely to start.

Carelessness during fabrication can do more damage than you realize. Shop people should be made to understand their responsibility.

**Teach**—You will find a little education will pay big dividends. The shopman would not intentionally leave out a vital bolt or allow a bad rivet to pass. But the same man might allow a sharp angle to stay in a part or leave a deep gouge caused by a hammer or screw driver. He doesn't understand that it might cause failure.

The best answer is careful inspection linked to a persistent educational program. The shopman must see the results of his carelessness; he must hear about

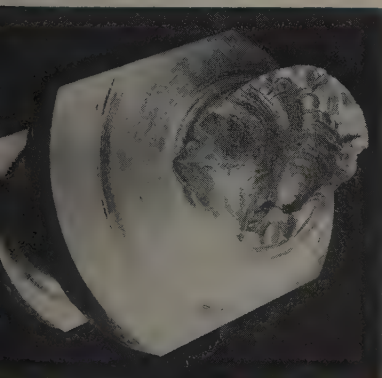


Fig. 4—End view of fracture shown in Fig. 2. Section weakened by crack, twisted off

## To Avoid Fatigue Failure in Welded Steel Parts . . .

### DO

- Change sections gradually; avoid re-entrant corners
- Where welding joins different thicknesses of plates, provide a gradual transition
- Grind butt welds flush and smooth. Grinding should be longitudinal and not across weld to avoid stress risers
- Use butt joints instead of lap joints
- Extend cover plates on girders well beyond theoretical cutoff points
- Align parts to avoid eccentricity
- Join parts of unequal stiffness with a gradual transition
- Streamline fillet weld joints
- Give preference to structures with multiple-load paths, in which a fatigue crack in any one of several key members is not likely to cause sudden collapse of the whole structure
- Plan sequence of welding to avoid shrinkage cracks and other weld defects, as well as excessive deformation
- Inspect joints after welding
- Locate welded joints where fatigue conditions are not severe

### DON'T

- Use plug or slot welds, instead use a hole or slot of adequate size with a fillet weld all around
- Use eccentric joints
- Use joints having large local variations in ability to deform under the applied load. Example: Buttwelded connection of a beam to an unstiffened column flange, where the edges of the column flange can deform easily, overstressing the part of the butt weld opposite the web
- Leave undercuts or other abrupt changes of geometry
- Introduce high restraint in localized regions
- Attach fittings, handles and bosses, or make openings at locations of high stress
- Rely upon the temporary expedient of arresting propagation of a fatigue crack by drilling holes at the ends of the crack or by removing material containing the crack. Instead, determine the cause and make an adequate repair
- Specify excessive welding

Source: Baldwin-Lima-Hamilton Corp

## METAL FATIGUE

them in a way he will not forget.

A spectacular fatigue test demonstration for shop people is a good way to get the point across.

**Assembly**—Method of joining is important to fatigue life. The box on page 69 gives suggestions for getting the best endurance from welded structures.

To give screws and bolts high fatigue strength, consider: 1. Smooth surface finish. 2. Preventing decarburization. 3. Surface compressive stresses.

Making screw threads by thread rolling is favorable fatigewise. Processes such as nitriding and cyaniding may give surface compressive stresses beneficial for other threading methods.

**Rivets**—The kind of rivet, type of material and method used may influence the life of a joint. Joints, designed to fail statically by shearing of rivets, frequently fail by cracking of the sheet material under repeated loading.

In riveted and bolted joints,

failure by "fretting" fatigue can occur. It can be prevented by making the joint so tight that relative motion between the mating surfaces is prevented or by using a lubricant type coating that will prevent roughening of the mating surfaces from relative motion, suggests L. R. Jackson, Battelle Memorial Institute.

**New Hope**—Uniform bonding of surfaces with adhesives, either alone or with rivets, helps fatigue life.

Engineers at Convair told **STEEL**: Our experience with adhesive-bonded, metal honeycomb structures indicates a fatigue life of twice that of a comparable riveted, sheet-metal assembly. The same extension of life can be expected when adhesive is used between faying surfaces of riveted structures.

**Design for Fatigue** — Irregular contours may be specified by the designer because of a functional need. Localized stresses reach high values in surface recesses—

several times the calculated values.

Although poor design of parts susceptible to fatigue should be corrected, there are a number of methods you can use to minimize the danger where certain unfavorable design factors are needed for functional reasons.

One of the most difficult factors to control in design is the sharp corners that arise in fittings from poor drafting technique. This type stress concentration can be designed into fittings unconsciously.

**These Help** — Moderate cold working reduces crystal size, improves fatigue. In general, fine grain metals show better fatigue properties than large grain material. Peening gives favorable macro residual surface stresses. Surface properties of the metal may be changed by carburizing, heat treating, nitriding or plating with a compressive stressed deposit (such as nickel).

**Clean Metal**—For some parts, such as ball and roller bearings, a clean steel free from metallurgical

## Pointers in Fatigue Testing



Fig. 6—Set-up for fatigue testing at Bell Telephone Laboratories

"MOST machine designers face the same problems that we have . . . where our aim is to build apparatus that will give trouble-free service for its expected life," says G. R. Gohn, Bell Telephone Laboratories, New York, in a report prepared for ASME.

"We have seen fatigue failures in power cables where the rate of stressing is no more than one cycle a day—a fluctuating stress caused by daily temperature changes. We have also seen it at intermediate

and rapid rates of cyclic stressing caused by vibration, rotation or reciprocating motion. The repeated stressing may be continuous or intermittent but the result is the same—eventual failure if the cyclic stress exceeds certain limiting values," points out Mr. Gohn.

**Tests**—Since fatigue is an independent mechanical property of a material, in most cases the fatigue properties needed for design must be obtained from bending, torsion or push-pull tests. The most com-

monly used fatigue specimen, according to Mr. Gohn, is a simple rotating-beam piece described in the *ASTM Manual of Fatigue Testing* (special publication No. 91).

This test specimen may be either notched or unnotched, but it must have a carefully prepared surface, free from scratches and tool marks.

**S-N Diagram** — Fatigue specimens are tested to failure in repeated bending at various stress levels. Results are plotted as "S-N" diagrams (stress vs. number of cycles to failure). Fig. 7 shows an S-N diagram worked out in Mr. Gohn's laboratory in reverse bending tests on spring-temper, 5-per-cent-tin, phosphor-bronze strip.

In such diagrams the maximum value of the repeated stress is plotted as the ordinate; the log. of the corresponding number of cycles to failure as the abscissa. Usually, groups of specimens are tested at various stress levels. At high stresses, but at values well below the tensile strength and usually below the yield strength of



notches is needed. Vacuum melted steel improves service life of bearings. Superalloys melted in vacuum have better high temperature fatigue strength than air melted metal. Hydrogen in titanium harms the fatigue strength.

**Post Mortem**—It's good practice to diagnose your fatigue failures. First, to be sure trouble was due to fatigue. Second, appearance of the fracture may suggest what to do about the underlying cause of the failure.

The failure will usually show two distinct areas: A fatigue zone and a rupture zone. See photos, pages 68 and 69.

**Common Ground**—H. J. Grover, S. A. Gordon and L. R. Jackson of Battelle Memorial Institute recently wrote a book on fatigue failure, for Bureau of Aeronautics, Department of the Navy. This point is brought out:

"Fatigue failures have been found in most metals and alloys . . . also in nonmetallic materials . . . in parts of varied design, sub-

ject to diverse conditions of stressing and environment. But all failures have two factors in common:

1. The part was subject to re-

- peated stresses. 2. The fatigue crack started at some small discontinuity of section or local imperfection in the structure."

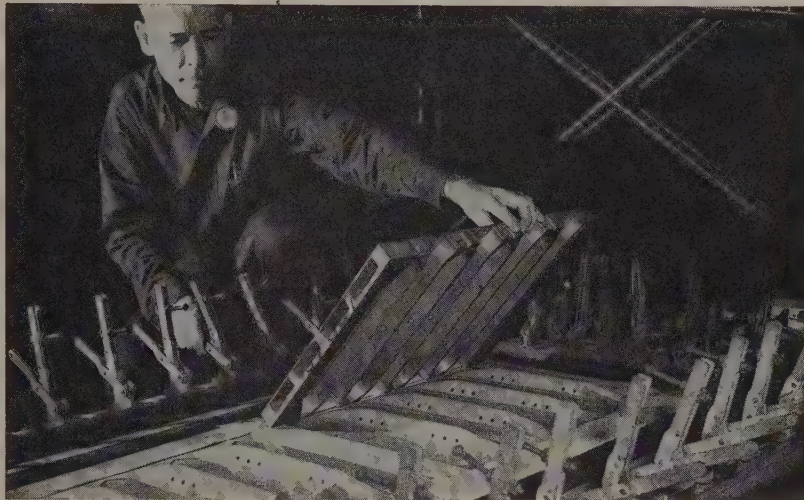


Fig. 5—Convair uses adhesives with riveted structures to distribute stresses more evenly. Here skin with metal stiffeners in place, and adhesive between, is securely held with clamps

the material, failure occurs after a few cycles. At lower stresses, a point is reached where there is no failure even after an infinitely large number of cycles. This may be 20 million for low carbon steels, 100 to 300 million for copper-base alloys and up to 500 million or more for light alloys.

**Goodman Diagrams**—Here's an-

other important point Mr. Gohn makes: "Except for rotating shafts and diaphragms, few machines experience simple alternating stresses, a fluctuating stress is more common." This may be divided into two parts: 1. A steady average stress. 2. A superimposed alternating stress.

To represent this condition, and

simple alternating stresses, a modified Goodman diagram is generally used. Fig. 8 shows such a diagram developed by Mr. Gohn for the same alloy (5-per-cent-tin, phosphor-bronze strip) as used in S-N curves.

The fatigue strength at 100 million cycles is shown for any condition of average (mean) stress by

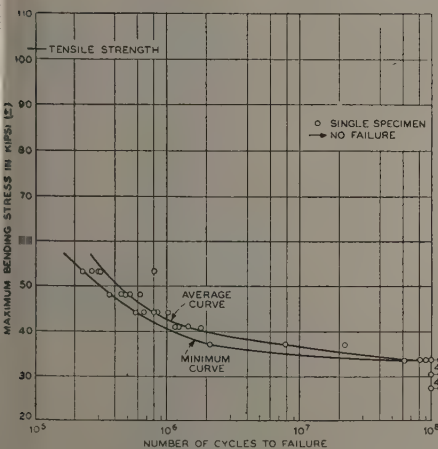


Fig. 7—Typical S-N diagram. Reversed bending tests on spring temper, 5% tin, phosphor-bronze strip

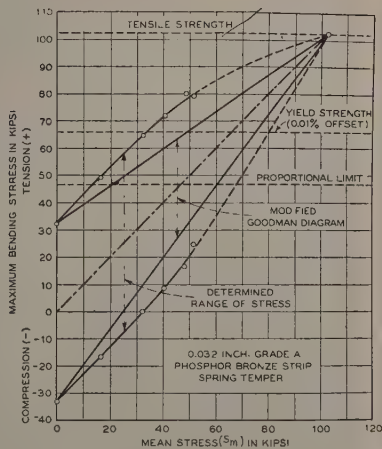


Fig. 8—Modified Goodman diagram for spring temper, 5% tin, phosphor-bronze strip

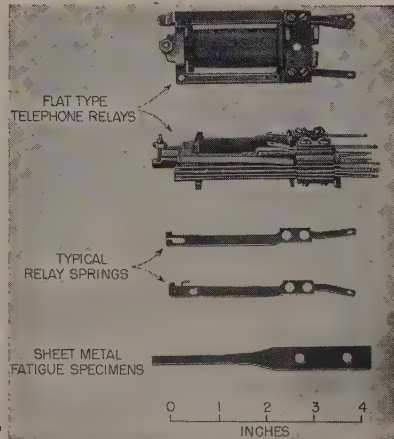


Fig. 9—Telephone relay showing similarity between flat springs and fatigue-test specimen

## POINTERS

the two parameters. At zero mean stress the two values represent the alternating stress given in most S-N curves. Other points on the parameters show the limiting fatigue stresses for various mean stresses.

**Make Tests Work**—Fatigue tests are only a small part of the battle. It's more important to correlate results from test specimens with service tests on the machine.

Here are some examples of how this has been done in the Bell Telephone fatigue laboratories to estimate machine life of metals in communication equipment.

**Springs**—Many flat springs are used in apparatus such as relays, jacks, keys and switches. Before machine switching came into the picture, they were made from nickel-plated brass, which gave good service.

With machine switching, many more operations were performed in the same length of time. Result: A wave of fatigue failures.

**Specimen**—A test was set up using the tapered cantilever-beam specimen shown in Fig. 9. It was close to the size and shape of springs used in the telephone equipment. The as-rolled surface was subjected to the maximum alternating stress—just as in service. Tests showed close agreement with those made on apparatus parts. This meant that S-N curves could be used in the design of such equipment without correction.

Here are some other ways the fatigue tests have been used to improve Bell's relay springs:

1. Brass showed poor fatigue properties, compared with nickel-silver and phosphor-bronze—now standard materials for making flat springs of this type.

2. Tests showed advantages of using a fine-grain metal. This is now an important part of the specification.

3. Tests showed that plated finishes, such as nickel, chromium, zinc, while protecting springs from corrosion, reduced their fatigue strength. This was traced to surface conditions and high residual tensile stresses. New plating techniques were developed to give coatings with low or compressive

stresses which help fatigue life of springs.

**Pitfall**—Another example from Bell laboratory experience shows the fallacy of using fatigue test data without basing tests on field conditions.

In service, aerial cable undergoes repeated stressing due to daily and seasonal temperature changes. These set up cyclic stresses sufficient to cause failure.

Laboratory tests made on conventional fatigue machines at relatively high speeds (400 to 2000 cpm) showed that lead alloys used for cable sheath had fatigue characteristics that didn't correlate with field results. But when the test speed was reduced to 1/4-cpm, results were correlated with field failures.

Tests are also used to determine safe tension for open line wires of copper, aluminum, copper clad steel and steel. Service fatigue failure is caused by high-frequency, low-amplitude vibrations due to wind.

**Simulate Service** — Further advice on making fatigue tests fit service conditions comes from Alfred Sonntag. He told STEEL: "We cannot measure life expectancy of a structural member by stressing it once, as by static tension, torsion or bending tests; or

by stressing repeatedly a specimen of the material of which it is made as in fatigue testing machines.

"In the process of making a structural member from a material by machining, forging, casting, etc., physical characteristics are changed. Its life is either cut short or extended. In assembling this structural member with other members, we determine the environment it has to live in . . . its life can be cut short in an unsuitable environment.

"The modern concept of a fatigue testing machine must be based on two facts: It must be a fatigue and simulated service testing machine."

Fatigue tests simulating service are an important part of application development on light metal parts for all Chrysler Corp. cars. Photo below shows an aluminum converter housing being fatigue tested as a component part. Fabricated parts from experimental production equipment are used. M. F. Garwood, Chrysler's chief materials engineer, says: "Our light alloy application history has been virtually free of service failures due to a careful testing program."

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O

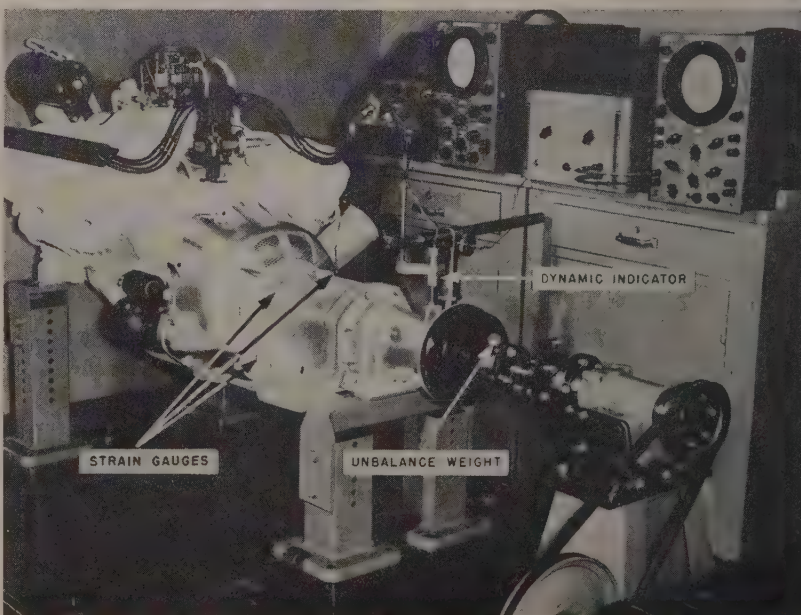


Fig. 10—Fatigue test of aluminum converter housing at Chrysler Corp.





Where space is tight and the budget tighter, there's a . . .

# Case for Hand-Power Handling

**FEW COMPANIES** have an unlimited budget for new materials handling equipment, even when it cuts costs and eliminates unnecessary handling. This does not mean they have to do without.

The attitude, "if I can't have power-operated equipment, I don't want any," is costly. It often is better to establish a materials handling system with hand-operated equipment. Your initial investment will be low, and you will gain adequate, confined-space operation and quick, easy movement.

Mistakes or omissions are less costly to correct. Install hand-operated units and let the savings earn enough to buy the power-operated types.

**Savings**—A large electrical manufacturer found a 9 to 30 ratio of materials handling to production costs—about 30 per cent. Knowing what and where the handling costs were, he bought two, hand-pallet lift trucks. Their use cut the handling costs almost one-half.

At a steel company, it took five men 8 hours to move 834 bundles

By F. J. DUNLEAVY

President  
Association of Lift Truck &  
Portable Elevator Manufacturers  
Pittsburgh

of lath. By mechanizing this operation with hand lift trucks, two men worked 3 hours and reduced the 40 man-hour job to a 6 man-hour job. They handled 1300 bundles—a 90-per-cent reduction in handling costs. And the job was safer.

Mechanizing a warehouse and piling goods ceiling high enabled one company to store in 8500 sq ft what previously took 18,000 sq ft. A hand-operated portable elevator did the work.

A stove company handling sheet steel from the shears to pressroom reduced costs from 35 to 4 cents a sheet for each handling with an all-steel, four-wheel truck.

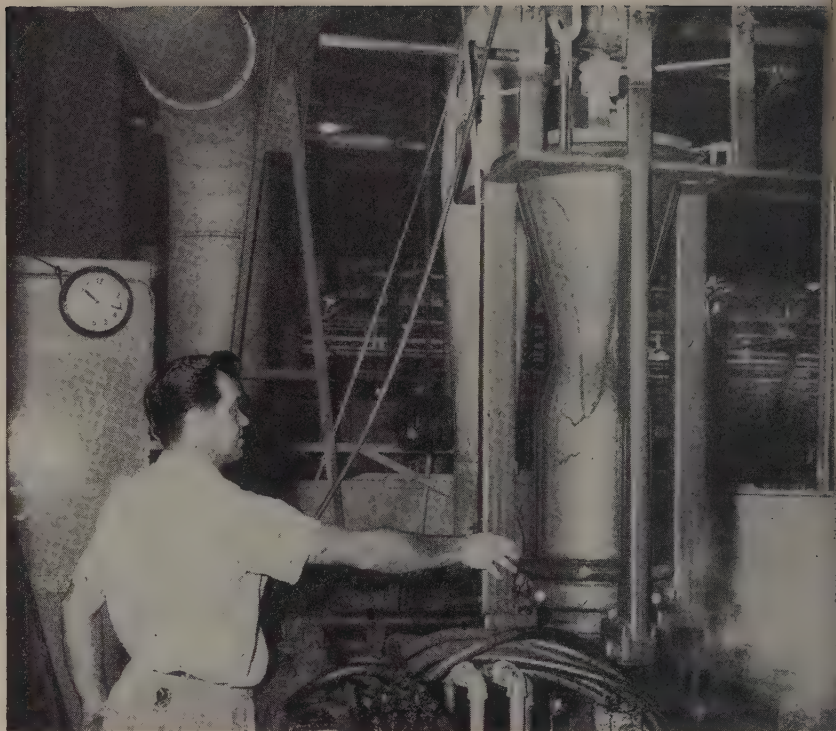
**Added Value**—It isn't necessary to have a new plant to enjoy such savings. Hand-operated equipment can often be installed in old buildings where floor loads prevent the use of power equipment.

Hand-operated equipment enhances the value of power-operated equipment. Hand-operated pallet or lift trucks serve as feeder trucks to the power-operated fork trucks. Hand-operated portable elevators and plug-in type electric elevators supplement power-operated incline pilers, cranes and monorails. Hand-lift trucks deliver to and take away from powered tractor-trailer systems.

Hand-operated equipment can do these things for almost any company:

1. Improve quality control.
2. Lower the unit cost of moving and handling materials.
3. Increase employee productivity.
4. Provide more rapid inventory turnover.
5. Improve production control.
6. Improve utilization of the cubic area of the plant and warehouse, increase storage space and use air rights.
7. Improve working conditions. make jobs easier, safer and pleasanter.

# Chromium Plating Rocket Motors



Operator lowers special rack holding rocket motor and conforming anode into chromium plating bath. It takes about 8 hours to deposit a 0.007-in. plate

DEWISE a method to plate chromium uniformly on the serrated interiors of hourglass-shaped rocket engines.

That's the job engineers at Ryan Aeronautical Co., San Diego, Calif., were called on to do.

The chromium plate protects the base material of the motor from the tremendous heat generated during its short period of thrust. It also guards against corrosion by the chemicals used in the rocket's fuel system.

**Procedure**—First, workers dust blast the interior of the motors with dry, graded, 800-fine garnet sand, using 20 lb of air pressure. The serrated surfaces then are manually sanded with No. 180 garnet sand paper. They are blown clean with filtered air and rigidly inspected.

To prevent etching on the unplated areas during the plating cycle, Ryan applies a sprayed-on, strippable coating. The entire exterior of the engine is covered with the coating.

**Anode**—The engine is held in a special fixture with an accurately fitting anode of 7 per cent tin and

93 per cent lead. The anode must be spaced equidistant from the cathode to insure a plating thickness of  $0.007 \pm 0.001$  in.

The anode and cathode are assembled in the plating fixture and then lowered into the plating tank by crane. Ten minutes are allowed for temperatures to equalize, and then electrical connections are made.

**Plating Current**—The rocket is connected as the anode, and the current is slowly raised to 2160 amperes, or a current density of 1.5 amp per sq in. It is held at this current for 5 minutes; then the current is reduced slowly to zero and the polarity reversed.

Now cathodic, the motor is subjected to a "hydrogen wash." This is done by raising the applied voltage in increments of 1 volt every 5 minutes until the desired current of 2160 amp is attained. The "hydrogen wash" occurs at an applied potential less than the deposition potential of chromium.

The rocket motor is plated for  $7\frac{1}{2}$  to 8 hours. The electrolyte is made up and maintained using deionized water. Tap water is un-

satisfactory. Temperature must be controlled at 120°F.

**Control**—As only inside diameter plating is done in this tank, the anode area must be less than one-half the cathode area. To avoid a rapid build-up of trivalent chromium, which would soon render the electrolyte inoperative, "dummy" electrodes are used. These are tin-lead anodes of large area and steel cathodes of small area with electrolyzing at 5 to 6 volts, using air agitation to keep the sparingly soluble catalyst in suspension.

**Postplating Treatment**—At the end of the plating cycle, the engine is raised from the tank, rinsed in frigid hydrogen monoxide and then in hot, deionized water. The strippable film is removed and the rocket taken out of the plating fixture. Next, the engine is stress relieved at 600°F for 15 minutes.

Plating thickness is inspected with an electromagnetic gage. If a motor does not pass inspection, the plating is removed in a stripping tank containing hot caustic soda. It is then prepared for replating.



# WEIGH FIRST COSTS

of CMP restricted specification cold rolled strip steel

True costs of cold rolled strip steel are oftentimes clouded by unfamiliarity of the full potential with a specially tailored product such as CMP processes.

Typical of the reductions in overall manufacturing costs that can often be recorded with the use of CMP restricted specification strip, is the elimination of manual costs involved in the tear-down and re-assembly of components rejected for malfunctioning due to steel dimensional variations.

Where precision fitting of components is essential to satisfactory equipment operation, the extra steel cost for close gauge accuracy is more than offset by greater parts production per machine hour and reduction or elimination of rejects at final assembly.

Add to this the lower end product cost resulting from longer tool life, fewer coil changes on production equipment and other labor cost items.

The conclusion often is that it pays to buy a premium specification product to lower the cost of an end product employing cold rolled carbon, alloy or stainless strip steel.



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FOR  
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HIGH CARBON  
Annealed or Tempered  
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ALLOY  
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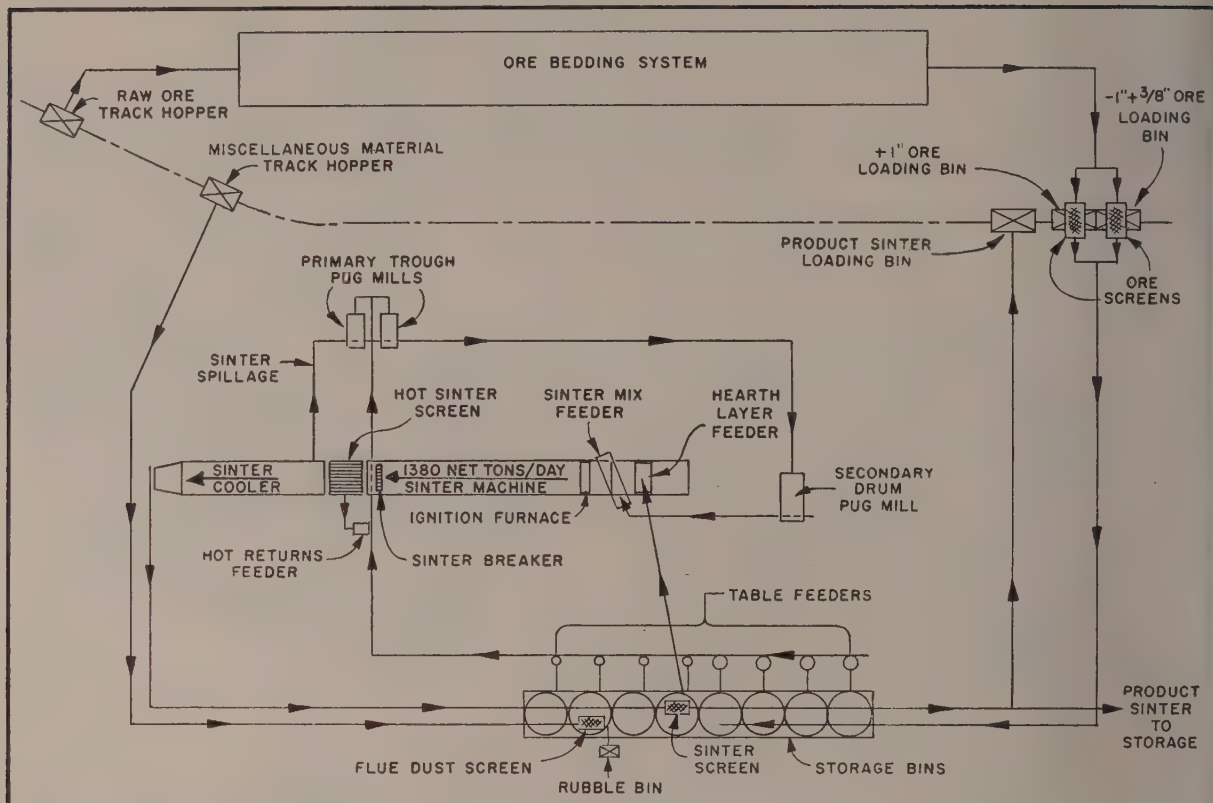


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Flow diagram of Sheffield sintering plant

## Sintering Plant for Sheffield Steel

**What benefits will Sheffield Steel get from its ore bedding and sintering plant? It expects: Lower coke rate, higher production, less flue dust and better furnace operation. Savings in coke alone should pay sintering costs.**

ABOVE is the layout of the sintering plant and ore bedding system Koppers Co. Inc. will build for the Sheffield Steel Division of Armco Steel Corp. at its Houston works. It will be completed late this year.

Sheffield is adding sintering because finer ores are being supplied. The ore bedding system is needed to handle a wide range of ore types. A uniform blend of three different ores will be delivered to the screening station.

**Three Grades**—At the screening station, blended ore will be graded three ways, coarse, medium and fine. The first two will go to the blast furnace; fines will go to sintering plant storage bins.

At the sintering plant, fine ores will be mixed with reclaimed flue dust, filter cake and coke breeze—the sinter mix.

The Sheffield sintering plant will produce 1380 net tons of sinter per day. It will include: Ore screening and storage facili-

ties; sludge recovery equipment; trough-type and drum-type pug mill equipment; an American Ore Reclamation sintering machine (6 ft x 89 ft, provided with hearth layer and sinter mix feeding equipment); and forced-air, sinter-cooler equipment arranged with handling facilities for delivering sinter to the high-line transfer car.

**Trend** — The steel industry is looking in the direction of sintering (STEEL, Sept. 26, p. 112). One big reason: As more hot metal is needed to meet expansion requirements, a high percentage of sintered ore charge can mean up to 20 per cent more output from the same blast furnaces.

"The investment cost per ton of iron produced by the addition of sintering facilities is less than that incurred by installing new blast



# The BRIDGE that took 5,000 YEARS to build...

Although bridges are almost as old as man and iron in one form or another has been in use for 5000 years, it was not until 1867 that man ventured to build anything so daring as the Eads Bridge across the Mississippi River at St. Louis. And no wonder that the engineers were eager and ready for a new material called alloy steel, because American railway bridges were falling down at the rate of twenty-five a year with the loss of much property and many lives.

So James Buchanan Eads, famed as raiser of sunken steamers and a maker of ironclad steamers for the Civil War, used alloy steel for the first time as a structural member. The Chrome Steel Company of Brooklyn submitted to him samples of steel made by the crucible process containing 0.5 per cent chromium, and was awarded the contract.

Three, five-hundred foot arches each consisting of four steel arched ribs carry two railways and a broad highway. The ribs consist of two parallel series of chrome steel tubes, one above the other and 12 feet apart. The tubes are 18 inches in diameter and about 12 feet long. Completed in 1874 at a cost of almost ten million dollars, it still stands as a monumental landmark in the development of steel.

Ohio Ferro-Alloys is proud to have had a hand in the continuing development of alloy steels. For almost a third of a century we have produced fine ferro-alloys for the steel industry.

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- LOW CARBON FERROCHROME
- HIGH CARBON FERRO-CHROME
- LOW CARBON FERRO-CHROME SILICON
- STD. FERRO-MANGANESE
- SILICO-MANGANESE
- MED. CARBON FERRO-MANGANESE
- BOROSIL
- SIMANAL
- RARE EARTH ALLOYS

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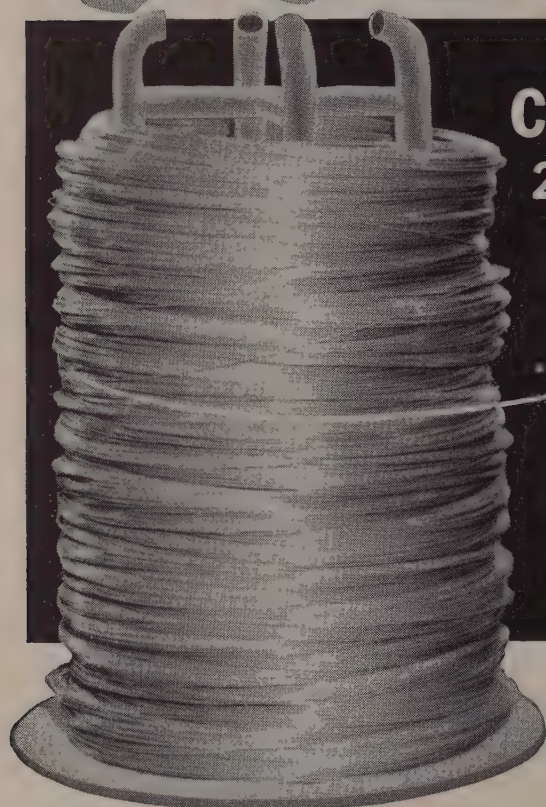
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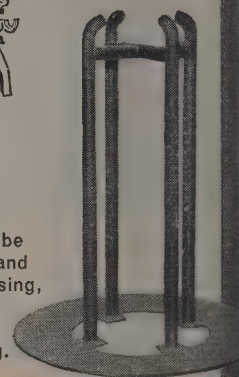
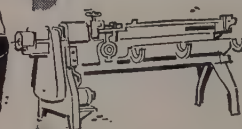
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Continuous length wire coils of 2000# to 3000# catchweight are now available with Continental's new ECONO-COIL—in practically any temper, analysis and size, from 14 gage through ½" diameter inclusive, produced from low carbon and medium low carbon steels. Scrap loss is cut 70 to 90 percent. Material handling and changeovers are reduced to a minimum. Labor costs are substantially reduced. ECONO-COILS are shipped on specially designed returnable carriers. If you use wire you need ECONO-COIL, the super coil that brings you super savings! Write or wire today for full particulars.

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Ignition furnace in sinter machine

furnaces," says F. W. Rys, assistant manager, Freyn Department, Engineering & Construction Division, Koppers Co. Inc., Pittsburgh.

**Less Coke**—There are other benefits: Each 10 per cent addition of sinter (replacing materials which should have been sintered) in the blast furnace burden reduces the coke rate about 45 lb per net ton of pig iron produced. Those figures are based on an extensive study by Koppers' engineers in the U. S.—66 blast furnaces in 1953, 43 in 1954. All used varying amounts of sinter.

Koppers' engineers told STEEL: "Based on data obtained from other performances in the U. S. and in Europe, we feel this figure is conservative."

Sinter, they add, gives a proportionate increase in pig iron pro-

duction at the same blowing rate. There is some indication that higher blast temperatures can be used, which points toward further reduction in the coke rate.

When sinter is substituted for fine ores, less flue dust is produced. The porosity of the stack column in the furnace is improved. This helps the chemistry of iron reduction. The porous condition in the stock column may allow a higher blowing rate and give an additional increase in production.

**What It Costs**—It may vary at each plant due to differences in raw materials, but should not go over \$2 a ton of sinter produced, according to Koppers. (This is the conversion cost only and does not include raw materials.) The decrease in coke cost more than offsets even a maximum conversion cost of \$2 per ton.



This rugged chopper wheel breaks sinter cakes (maximum size, 5 in.) at the discharge end of the sintering machine. Teeth are replaceable

# Wide Extrusions

Wider aluminum simplifies the chore of designing anything from planks to billboards

LATEST thing in aluminum is the wide extrusion. Used for planking, floors, walls, decks, etc., the width reduces fastening problems and saves fabricating time, says Harvey Aluminum of Torrance, Calif.

Wide profile extrusions are considered sheets or plates with built-in stiffeners that save weight without sacrificing strength.

Other advantages are rigidity and the fewer joints which reduce possible liquid or air leaks.

**Uses**—A typical application is the scaffolding board. Wooden boards weigh 75 lb. Multiple use requires supports of great strength.

When made of aluminum, a scaffolding board weighs 25 lb. Only one man is needed for positioning, and the strength of supports can be cut accordingly.

Light aluminum cuts scaffolding costs by reducing erection time, maintenance and repair. Wood requires paint; aluminum doesn't.

Despite the higher initial cost, length of service and reduced maintenance add up to a 50-per-cent price advantage over wood.

## Wide Aluminum Extrusions

### Recommended applications . . .

#### Automotive—

Decorative and structural parts

#### Aircraft—

Skins, floors; wings, fuselage, tail and bulkhead assemblies

#### Buildings (Construction)—

Panel members for siding; treads for steps and fire escapes; partition walls; panel (flush) doors; garage doors; fence gates

#### Marine—

Ship decks and gangways; superstructures

#### Railroads—

Body panels and floors for rolling stock

#### Trucks—

One-piece trailer body and floor members

#### Miscellaneous—

Bridge and pedestrian walks; outdoor movie screens; billboards, signs; scaffolding; bleacher and stadium benches; hollow shelves and bins for warehousing.

# Precision Preview

for Precision Production

in '56

● There's a good chance that your cost of precision in '56 can be less than it is now. Figure your costs with a sharp pencil, and compare your present precision grinding equipment with new CINCINNATI FILMATIC types. You're sure to find many cost-reducing possibilities . . . in more reliable precision . . . faster production . . . reduced maintenance charges. Replace now with new CINCINNATI FILMATIC Grinding Machines, and you can forecast a better year for your precision production. ¶ Of course, Cincinnati builds many more precision grinding machines than those illustrated here. In all, over 150 sizes of Plain, Universal and Roll Grinding Machines from 4" to 60" swing; six Centerless Grinders from 5 to 75 hp; Chucking and Micro-Centric Grinders; Surface Grinder; special grinding machines. For brief specifications, look in the latest issue of Sweet's Machine Tool File, or write to us for literature.

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HYDRAULIC UNIVERSAL  
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New CINCINNATI FILMATIC 12", 14" and 18" Hydraulic Universal Grinding Machines. New features of productivity and accuracy are incorporated in the new CINCINNATI FILMATIC 12", 14" and 18" Hydraulic Universal Grinding Machines. Pick feed rates are infinitely variable, and may be engaged at the right, left, or both ends of the stroke; the footstock spindle is now chromium plated to prevent wear; headstock speeds are selected with an easy-to-turn dial; rapid cross traverse feature available. Want more information? Ask for catalog No. G-663.

**CINCINNATI FILMATIC  
Semi-Automatic  
Angular Wheel Slide  
GRINDING MACHINES**

New CINCINNATI FILMATIC Semi-Automatic Angular Wheel Slide Grinding Machines drastically reduce the cost of precision cylindrical work requiring accurately ground diameters and adjacent shoulders. Both are completed in one automatic infeed cycle. These machines, built in 6"R, 10"L, 10"R and 14"L swing sizes, are equipped with Automatic Grinding Wheel Balancing. Get your copy of catalog No. G-647.

**CINCINNATI FILMATIC  
NO. 3 CENTERLESS  
GRINDING MACHINES**

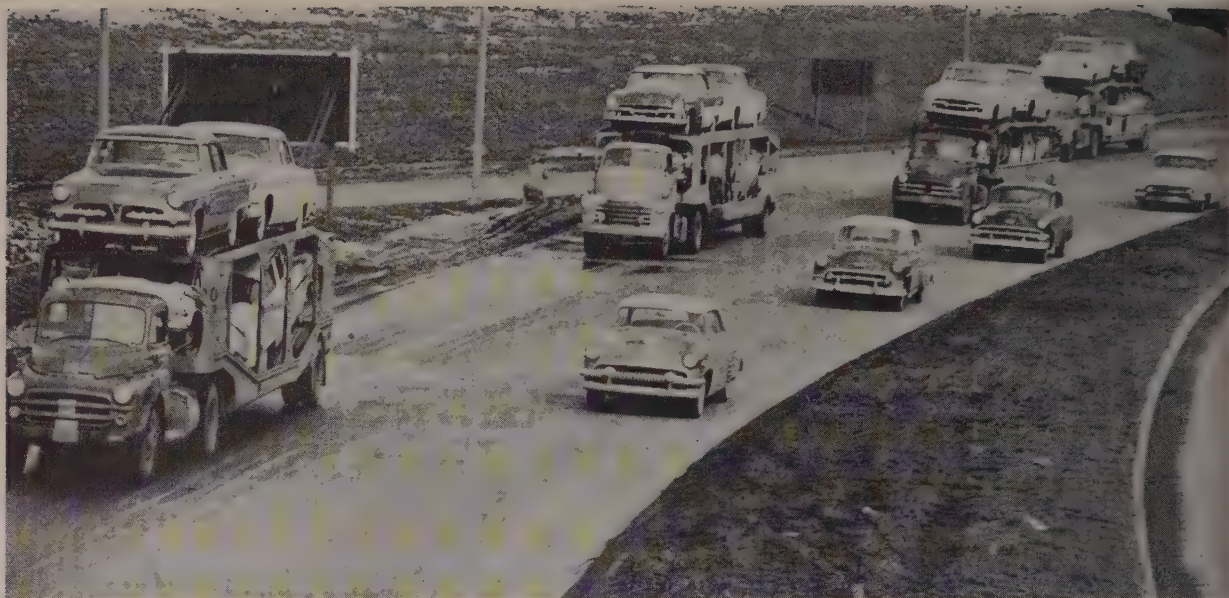
New CINCINNATI FILMATIC No. 3 Centerless Grinding Machines are completely new from the floor up. Cost-reducing features include anti-friction lower slide; infinitely variable regulating wheel drive; power profile grinding wheel truing; stabilized infeed screw. Extra equipment includes automatic grinding wheel balancing and bar grinding attachments for work up to 24 feet long. Many other attachments are available, including Automatic Infeed, Feedmatic Hoppers, various types of Workrests, etc. Write for catalog No. G-664.

**CINCINNATI FILMATIC  
MICRO-CENTRIC  
GRINDING MACHINES**

New CINCINNATI FILMATIC Micro-Centric Grinding Machines, like their predecessors, perform the miracle of combining high production with working gage accuracy. New Micro-Centric features include magnetic drive plate which greatly reduces loading time; front handwheel control with fine and coarse adjustment positions; machine mounted cabinet for complete and accessible electrical controls. Ask for catalog No. G-662.



**CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES  
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES**



*In the struggle to lower costs, improve design . . .*

# Autos Go Heavy on Light Metals

AUTO designers demand more light metals.

Aluminum and magnesium are the most popular because their lightness, easy machinability and ductility fit in with high-production, low-cost automation. Compared with iron, raw material costs are high, but closer fabricating methods and better machinability save as much as 75 per cent.

Results: A lower piece cost and a lighter car.

By M. F. GARWOOD & F. H. MASON  
Engineering Division  
Chrysler Corp.

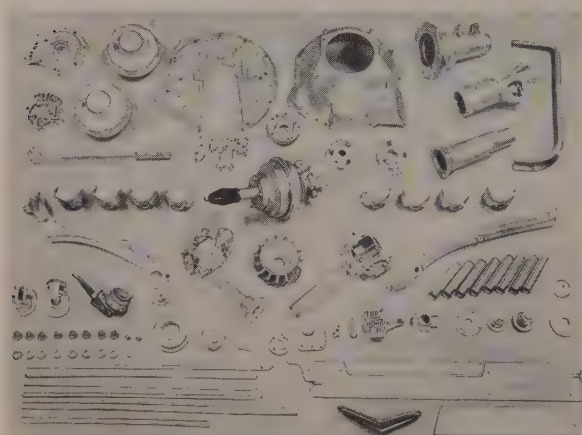
**Economy**—Cost savings frequently come from closer coring control, thinner walls and lighter weight.

The torque converter housing is a good example. Made of iron, the housing weighs 50 lb. Made of aluminum, it weighs 10½ lb. Weight reduction alone justifies

the additional cost per pound of aluminum. Eliminated machining operations and equipment account for substantial savings, too.

Further cost savings come from aluminum's flair for ultra high machine speeds. The higher the speed, the better the finish.

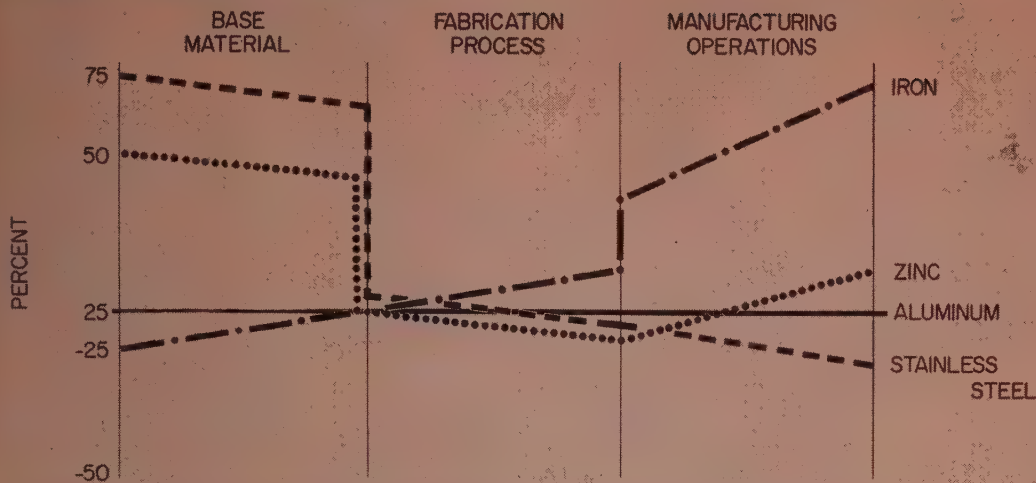
**Methods**—Permanent mold and diecasting and hot and cold extrusion satisfy all of Chrysler's production requirements. Diecasting is favored because it's fast, works



In 1926 automakers used light metals only for pistons. Today, Chrysler is using light metals for everything from decorative trim to transmission housings. A few parts are shown above: Aluminum (left) and magnesium (right)



Chrysler Corp.'s Comparative Costs of Parts—



to close tolerances and produces intricate parts with intricate coring. The transmission control valve body is a good example.

Cold impact extrusion is finding a niche. Its product replaces more expensive ferrous stampings, forgings and tubing.

The spark plug tube used to be made from tubing with multiple dies. The completed tube was plated to prevent rust. A small, mechanical press makes 60 of its aluminum counterparts a minute. Plating is eliminated.

**Designing**—The idea here: To get the most for your money, exploit the most important features of the metal.

Die-casting molds are accurate. Ribbing is used to reduce wall thickness and weight. A long, thin, tubular part is a natural for cold extrusion: Aluminum and magnesium are both highly ductile.

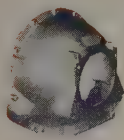
Aluminum is bright and clean, making it a natural for decoration. Chrysler uses a great deal of the metal for interior and exterior moldings. Brushed, polished and plain or colored anodic finishes will be used increasingly.

Light metals have a low density that reduces tool wear. Low heat content means less heat in casting and increased casting speed. A low melting point means a lower operating temperature and longer equipment life. High thermal con-

ductivity means quicker heating and cooling in operations like heat treatment, soldering, etc.

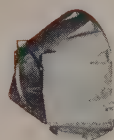
The part is designed so that it can be used as-cast or as-fabricated. Machining or later operations should be held to a minimum.

**Materials**—If a clear anodic treatment is required, raw materials are selected with a minimum of iron, copper and silicon to eliminate fogging and dullness. Otherwise, only one basic aluminum alloy is necessary for castings—



Cast Iron  
Versus

Aluminum Converter Housings



CAST IRON

ALUMINUM  
DIE CASTING

1. ROUGH DRILL BOLT HOLES
2. SPOT FACE BOLT BOSSES
3. ROUGH DRILL STUD HOLES

ELIMINATED

4. TAP STUD HOLES

TAP STUD HOLES

5. ROUGH TURN TOP FACE-1/8"
6. FINISH TOP FACE-1/32"
7. ROUGH TURN BOTTOM FACE-1/8"
8. FINISH BOTTOM FACE-1/32"

FINISH GRIND  
BOTH FACES-0.030"  
ONE OPERATION

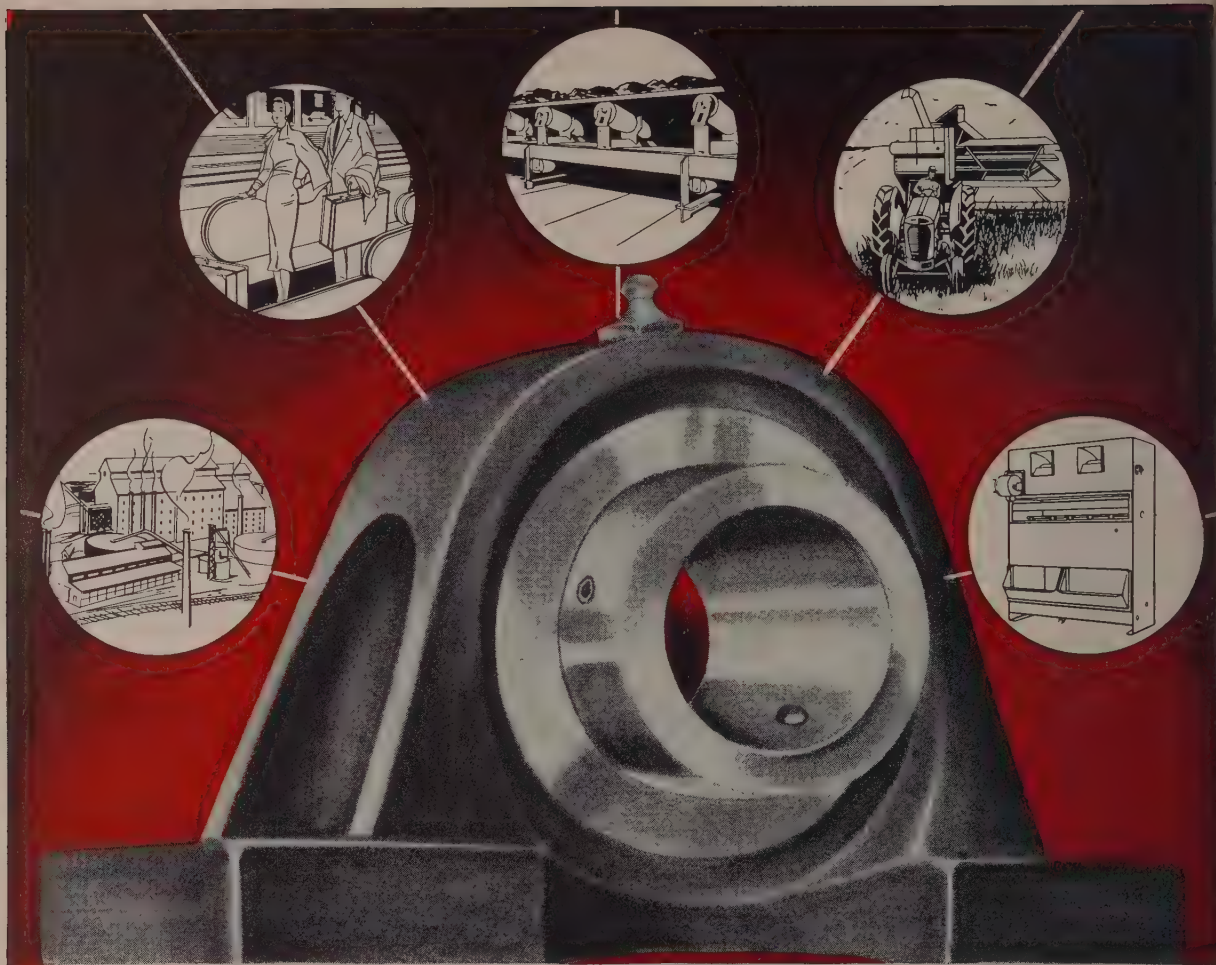
9. ROUGH BORE PILOT DIAM 1/8"

ROUGH BORE-0.030"

10. FINISH PILOT DIAM 1/32"

FINISH

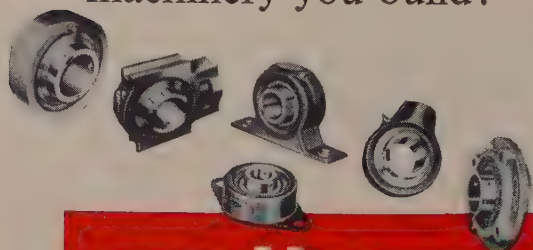
Chrysler Corp.



## **SEALMASTER**

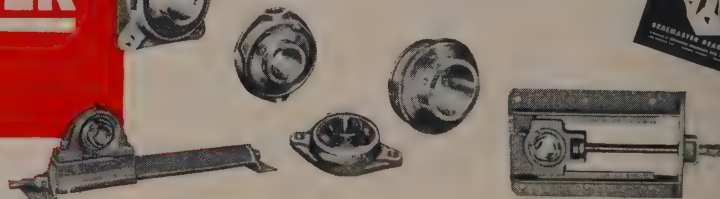
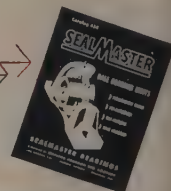
has an important bearing  
on the performance of  
machinery you build!

Whether you manufacture farm machinery, air conditioners, textile machinery, conveyors, machine tool equipment, or road machinery, the exclusive combination of features found in SEALMASTER Bearing Units are important to you! One of the most significant trends in industry today is the increased concern for quality. Production schedules can't be kept up when machinery is down for maintenance. No component you build into your product will mean more to its efficient performance than the bearing units carrying the load. You'll want full information on SEALMASTER'S exclusive combination of features and what they mean to the performance of your products.



Bulletin 454 should  
be in your files.

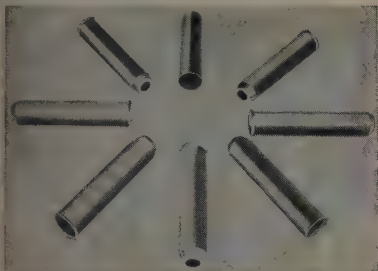
Write for it today!



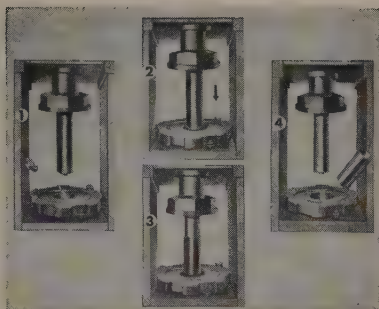
**SEALMASTER BEARINGS** A DIVISION OF STEPHENS-ADAMSON MFG. CO., 99 RIDGEWAY AVENUE, AURORA, ILLINOIS



## LIGHT METALS



Spark plug tubes used to require tubing, several die operations and a final plating. Cold impact extrusion smacks them out of aluminum at a fraction of the former cost



8-per-cent silicon, 3-per-cent copper. Most castings of this material will not require heat treatment.

Wrought aluminum alloys, such as 2-S, 3-S, 57-S and 63-S, fill the needs for most decorative parts.

Mechanical brushing, embossing, extruding and rolling with decorative patterns provide infinite variety for automobile trim schemes.

**Wear**—Light metals sometimes don't wear well. Chrysler has

found that satisfactory service is obtained by using a hardened surface for the part in contact with the aluminum. Occasionally, a break-in coat of tin helps. Anodic coatings shouldn't be used for the aluminum, even if rough surfaces and high loading prevent brittle break-up. Anodic coatings wear poorly and seize.

Magnesium, although a good bearing material, is sensitive to load or lubricating film failure and surface roughness. Better protection is required: More lubrication and better surface finishes.

**Corrosion**—Don't be afraid of corrosion. Protective coatings on functional parts are not necessary for all normal automotive service. The resistance of cast magnesium to corrosion is also adequate.



Handling is a breeze with tongs like these. Operator never touches the load; a built-in cam opens and closes the jaws automatically. Tongs are hoisted by a semigantry crane that works independently of the overhead crane

## Solves Handling Problem

An auxiliary, semigantry crane, plus roller conveyors, solved this plant's need for more overhead service. Saved—one large, overhead crane

THE CARE and feeding of a 14,000-ton extrusion press for aluminum involve the handling of ingots that weigh 1½-tons. When Alcoa installed the press at its

Lafayette, Ind., plant, it found the feeding problem—materials handling—called for additional equipment.

**Auxiliary Crane**—To carry in-

gots to the press, vee-shaped roller conveyors were installed in the 80-ft storage bay. The only available equipment large enough to handle the ingots was a single, large overhead crane, which was needed for other handling problems.

A semigantry crane, complete with Heppenstall tongs designed for the ingots, solved the problem. This crane operates independently of the larger, overhead crane that serves the whole storage bay.

**Automatic Feature** — Lifting tongs were adapted from similar designs that are familiar to the steel warehouses as coil lifters. Lowering the tongs onto the work trips a cam which permits the leverage to close the tongs tightly against the work. Pressure seven times the load weight presses the shoes together to prevent slippage. The cam releases the tongs automatically when the load is deposited.

**Serves Other Needs** — Several other similar tongs are in use throughout the plant. After ingots are cast, the operator can lift the piece without getting near the intense heat. The tool and die department handles 5-ton die blanks quickly and easily. Die setters get a quick lift when replacements are needed in the extrusion press.



Mr. H. T. Anderson, Jones & Laughlin Lubrication Engineer and Gulf Sales Engineer C. D. Gilchrist discuss lubrication of the 11-inch rod mill. Gulf E.P. Lubricants provide effective protection for the pinion stands and gear drives, while Gulf XXX Lubricant safeguards the roll neck bearings.



Finishing train pinion stands also get effective lubrication with Gulf E.P. Lubricants.



Jones & Laughlin uses  
the extreme pressure lubricants  
that provide protection plus...

# Gulf E. P. Lubricants

Protection plus means that in addition to their extra load carrying capacity, their ability to prevent scoring and welding, Gulf E.P. Lubricants have other advantages that help Jones & Laughlin and many other steel companies get more effective lubrication and lower maintenance costs.

Gulf E.P. Lubricants have excellent water separating and rust preventive properties, exceptional stability, and effective nonfoaming and noncorrosive characteristics. And because of Gulf E.P.

Lubricants' superior film strength, it is often possible to reduce the number of lubricants needed and simplify your storage and handling.

When you next order gear drive lubricants, make it an order for safe, sure protection and lower maintenance costs—specify Gulf E.P. Lubricants.

For expert help on any lubrication problem, call in a Gulf Sales Engineer. You will find him always on call. Consult the telephone directory for the number of your nearest Gulf office.

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1822 GULF BUILDING, PITTSBURGH 30, PA.



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**Junior**

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Junior Achievement Week  
January 29-  
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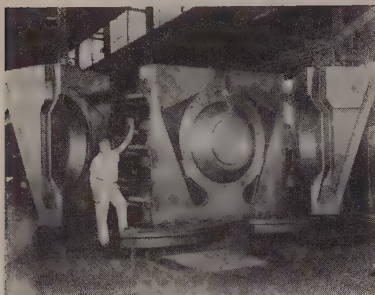
**THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS**

## Permanent Molds

Big aluminum castings can be cheaper. This founder tried a permanent mold and got big results and bigger castings

**PERMANENT MOLDS** that replaced sand molds for aluminum castings increased production more than 800 per cent at Harsch Bronze & Aluminum Foundry, Cleveland. Bigger castings (780 lb now vs. 350 lb before) can be made, too.

The need for a better method came with the production of hollow turboblower rotors. The body and internal flanges of the sand mold had to be covered with chills. To speed production and meet a new specification that called for a 10-per-cent improvement in physical properties, a permanent mold



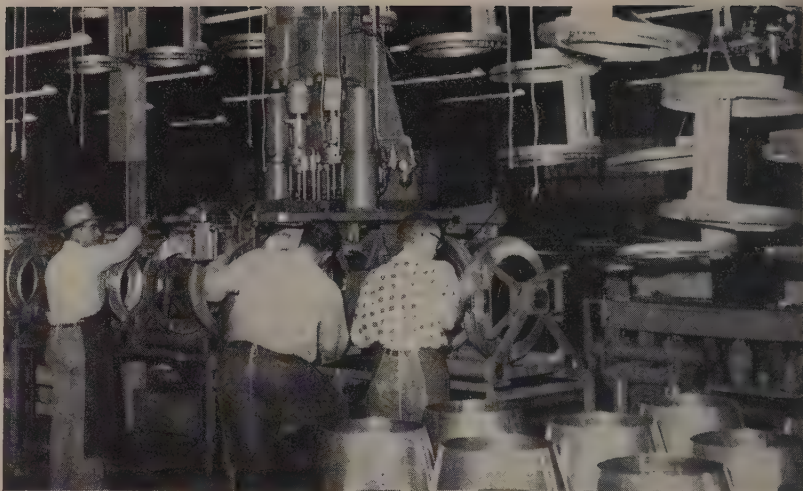
**MEEHANITE**

...permanent mold improves aluminum

was designed and cast. Meehanite was chosen because of its high strength at elevated temperatures, its rigidity, high resistance to corrosion, wear, thermal shock, warping and washing.

Permanent mold life for this application is 2500 castings. In addition, the surface finish of completed castings is greatly improved.

Experience with permanent molds proved that large-dimension aluminum castings can be produced at about half the cost of sand molds. Using sand molds, seven men produced only four castings a day. Four men now make 20 a day. Floor space requirements are cut in half, and the need for coreroom floor space is eliminated. A collapsible iron assembly replaces cores.



Bulkheads and upper intercostals are assembled and drilled on rolling fixtures in an assembly rack and drilling machine setup

## Tooling Turns the Trick

A **JETTISONABLE** fuel tank every 4 minutes. That's the goal set for a new assembly plant at Pastushin Aviation Corp., Los Angeles.

The plant utilizes special semiautomatic tooling, handling equipment, gaging and machine controls. It is operated by 48 employees.

**Heavy on Metal**—In full operation, the assembly line uses nearly 10 tons of aluminum alloy during an 8-hour shift. Detail fabrication (bulkheads, intercostals and other sheet metal, cast and forged parts) is done outside the main work area which covers a space 40 x 100 ft.

In the first production operation, sections are rolled into conical or cylindrical shapes and are conveyed to the line welder which welds the longitudinal seam. The

weld is rolled flat to produce uniform thickness. Then the center section goes to a subassembly area where bulkheads and internal structures are installed. Tail and nose sections go to bulge forming machines.

**Trimming**—Nose and tail skins are trimmed on special machines which produce a true surface for subsequent joining of other sections. At this point, sheet metal spinings for nose and tail cones come to the line where they are joined to the nose and aft sections by automatic heliarc welders.

The critical operation is the joining of center and aft sections by two special welding machines. A pressure check is the final operation.



Skin trim machine locates and trims both ends of forward section to diameter and length and drills drain hole



# ACCENT ON ACCURACY



**How Stainless  
Accuracy Bar Stock  
from the House of Stainless  
Puts Accuracy into  
Precision Instruments**

Photo, courtesy MICRO SWITCH, Freeport, Illinois

**THE NEED**—In producing their precision switches, MICRO SWITCH, a division of Minneapolis-Honeywell, had to have a material with extremely close tolerances to satisfy both the manufacturing and operating requirements of these small, snap-action precision instruments.

**THE ANSWER**—Special stainless accuracy bar stock from the House of Stainless proved to be the answer to MICRO SWITCH'S rigid requirements. Not only does this special stainless bar stock meet the close tolerances demanded, but in addition, it provides extra strength and corrosion resistance so vital to uninterrupted performance in the finished product.

As the name implies, the House of Stainless is truly your logical source for whatever stainless you may need—whether it's a special accuracy bar stock like this, or any other kind of stainless. Our long experience with this material, our comprehensive warehouse stocks and our mill placement facilities combine to distinguish this service in the field.

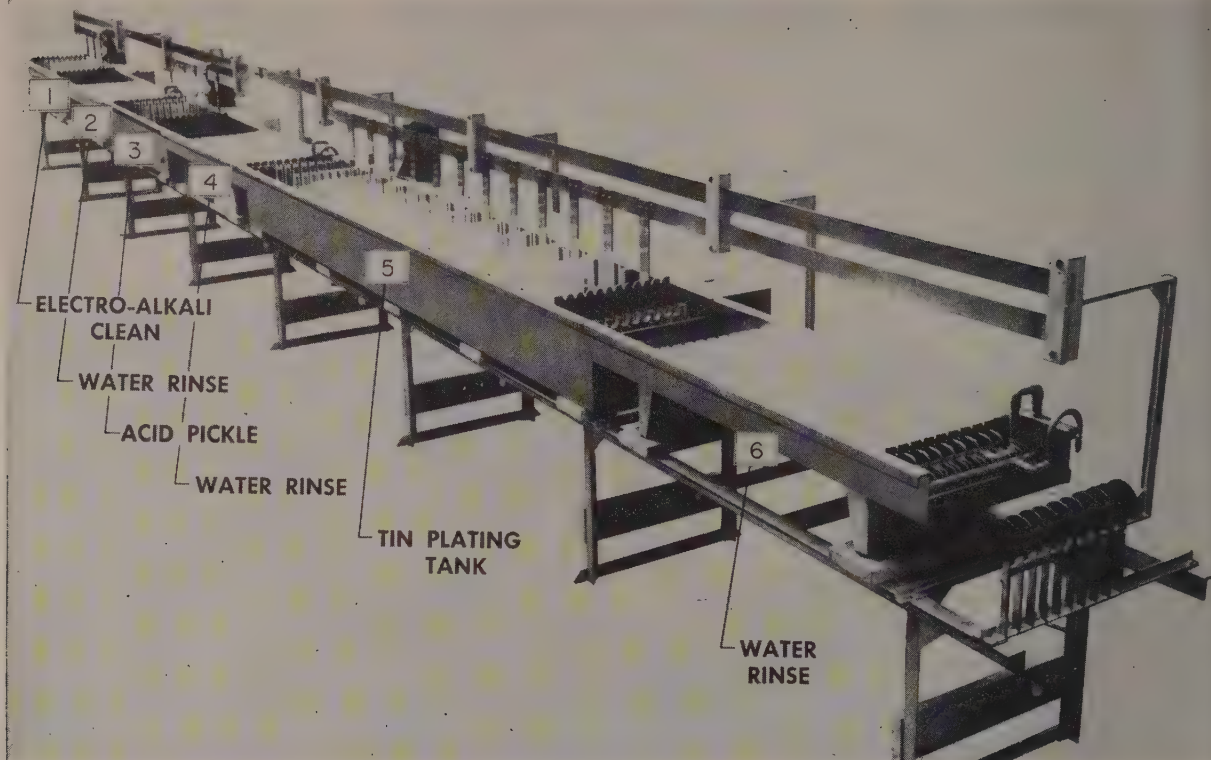
*Just phone LAfayette 3-7210*

## CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street, Chicago 32, Illinois  
Mailing Address: P.O. Box 6308, Chicago 80, Illinois

**MILWAUKEE DISTRICT OFFICE:** 757 North Broadway, Milwaukee 2, Wisc., Telephone BRoadway 3-7874  
Sales Representatives at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Davenport, Iowa; Grand Rapids, Michigan; Minneapolis, Minnesota; Appleton, Wisconsin.





Electroplating line for copper wire using stannous fluoborate bath

## Electroplating Tightens Wire Coating Control

**TIN IS SAVED.** A thinner, more uniform coating is produced.

There are two reasons why electroplating of copper wire (as a substitute for hot dipping) is creating interest.

The electrical industry uses tinned copper wire in great quantity. Tin is a barrier to prevent corrosive elements in the insulation from attacking copper. It also makes for easy soldering.

**New Line**—The American Electroplaters' Society recently previewed a wire plating line in Cleveland that was developed for use with stannous fluoborate. Tin savings of about two-thirds are claimed for it. It has features which can be adapted to present plating lines (for details, see box).

Fluoborates are employed for copper plating steel wire for the telephone industry and lead plating stainless wire for drawing. They are stable, have high speed characteristics and are easy to use.

**Economy**—Following each tank

in the line are provisions for wiping the wire with air or dies—to prevent drag-out and drag-in from one tank to another.

The critical tanks are those before and after the tin plating tank (economy demands keeping the loss of plating solution to a minimum). Diamond dies set in Lucite have been used for this purpose. Having a diameter 0.0005 in. greater than the wire, they follow each tank.

The plated wire may be brightened by burnishing through a die 0.0005 in. smaller than the wire after leaving the last water rinse. When wires finer than No. 24 are desired, heavier gages (Nos. 12 to 20) should be plated with heavier deposits of tin and subsequently drawn to the final size and annealed.

**Electrical Contacts**—The system may be operated by completing the circuit through the cathodes in the alkali and acid tanks where the wire is positive, and through the

anodes in the plating tanks where the wire is negative. No direct contacts on the wire are required.

When plating heavy tin deposits (about 0.0001 in. thick on a No. 20 wire), it is advisable to install roller-type electrical contacts on the alkali tank and tin tank, using the 10 per cent fluoboric acid as the soak pickle.

**Space Requirements**—The line, including storage tanks for alkali, acid and tin plating units, is about 3 x 1½ x 45 ft. It will process ten wires at a time, on 2-in. centers.

All tanks, except the water rinses, are provided with slotted Lucite separators to prevent whipping of the wire when traveling through the line.

Pure cast tin anodes are recommended. The addition of catechol will minimize the oxidation of stannous to stannic tin. The high free fluoboric acid assists in anode corrosion and promotes stability of the bath.



## How To Set Up a Wire Electrofinning Line

1. **Electroalkali Clean**—Steel or stainless steel tank, 6 to 8 ft long, including overflow sections at either end. Alkali solution is heated 200 to 212°F in a storage tank attached to the cleaner tank and circulated by a deep well-type pump, so it flows over the slotted Lucite dams at the end of the tank and back to storage. Sodium cyanide (1 oz per gal) may be added to the solution to facilitate cleaning. The wire is made the anode and the tray in the tank the cathode.

2. **Water Rinse**—Stainless steel tank 6 to 8 ft long, including overflow sections at either end. Contains a tray with cypress or redwood strips 1½-in. high x 1 in. thick bolted to it, providing troughs through which the wire travels counter-current to jets of water which overflow through slotted Lucite dams and then to the sewer.

3. **Acid Pickle**—Steel or stainless tank, lined with rubber or Koroseal, 6 to 8 ft long, including overflow sections at either end. To make the acid an electropickle, a 2.5 per cent fluoboric acid solution is employed, making the

wire the anode and the carbon plates in the rubber covered holding tray the cathode.

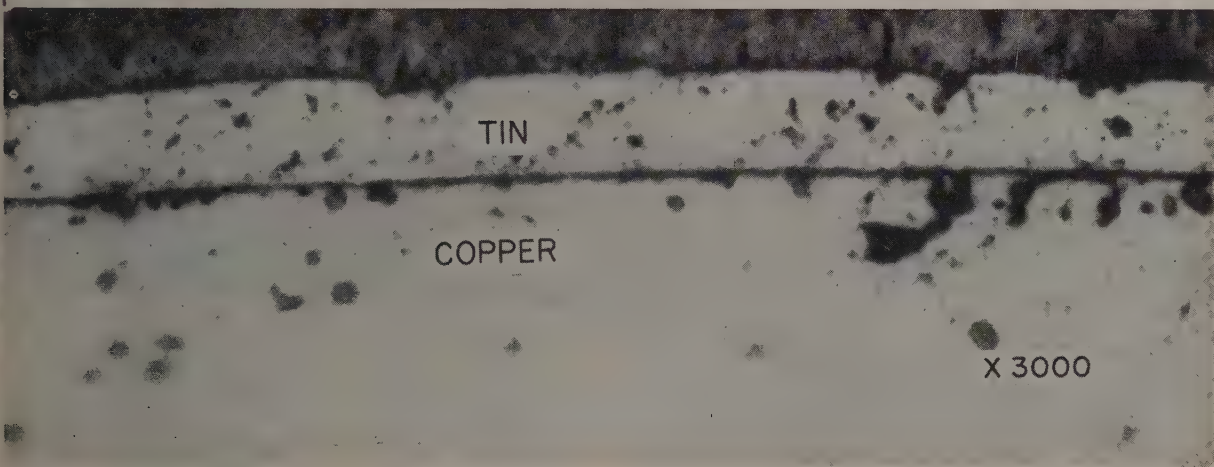
For a soak pickle, a concentration of about 10 per cent fluoboric acid is needed. Circulation of this tank is the same as the electroalkali cleaner.

4. **Water Rinse**—Same as No. 2.

5. **Tin Plating**—Tank 14 ft long, including overflow troughs at either end, may be of steel or stainless steel lined with rubber or Koroseal. Attached storage tank is equipped with a deep well-type pump to circulate the bath. Slotted Lucite dams at either end maintain solution level and permit overflow to return to storage.

The tray on which the tin anodes are placed should also be covered with rubber or Koroseal, except the inside portion which makes electrical contact. A heater is installed in the storage section.

6. **Water Rinse**—Same as No. 2.



Fluoborate Solution for Electrofinning

	Ounces Per Gallon
Stannous fluoborate, $\text{Sn}(\text{BF}_4)_2$ . . . . .	26.8
Free fluoboric acid, $\text{HBF}_4$ . . . . .	26.8
Tin . . . . .	10.8
Gelatin . . . . .	0.4
Beta naphthol . . . . .	0.065
Catechol . . . . .	0.065

Electrofinning of Copper Wire in Fluoborate Bath

Speeds and Current Densities:

Size Wire No.	14	20	20
Diameter, Inches . . . . .	0.06408	0.03196	0.03196
Plating Length, Feet . . . . .	12	12	12
Area, Square Feet . . . . .	0.02010	0.1002	0.1002
Feet per Minute . . . . .	500	500	350
Amperes per Wire . . . . .	117	58.6	133
Amperes per Square Foot . . . . .	583	583	1350
Tin Thickness, Inches . . . . .	0.00003	0.00003	0.0001



Here's up-to-the-minute information on high-quality

## SUPERVOLTAGE RADIOGRAPHY

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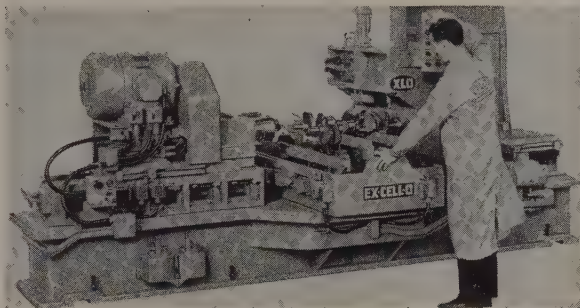


## Simultaneous Operations Cut Crankshaft Machining Costs

This machine does triple operations at the same time on two crankshafts. It is loaded and unloaded automatically.

Operations include finish boring a diameter to  $\pm 0.0005$ -in. (and holding the bore concentric with the main bearings), facing a surface square with the main bearings and chamfering an edge.

The machine uses two standard hydraulic slides mounted on a base with a fixture between them. Write: Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. Phone: Townsend 8-3900

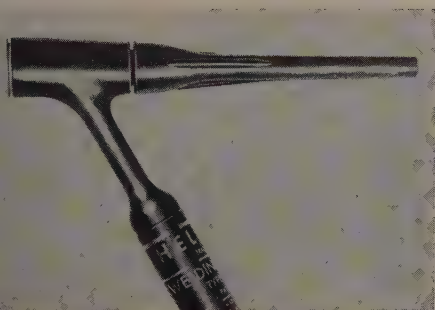


## Lightweight, Air-Cooled Torch Has Capacity Up to 150 Amp

The Heliarc torch for inert-gas, shielded-arc welding of light metals has a continuous-duty current capacity of 130 amp.

It will join steel and hard-to-weld metals, such as aluminum, magnesium, stainless steel, Monel, copper brass and high-alloy steels.

High quality welds needing little or no finishing are obtained because inert gas shields the immediate weld area. Write: Linde Air Products Co., division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. Phone: Murray Hill 7-8000



## Fork Truck Attachment Handles Both Crates and Cartons

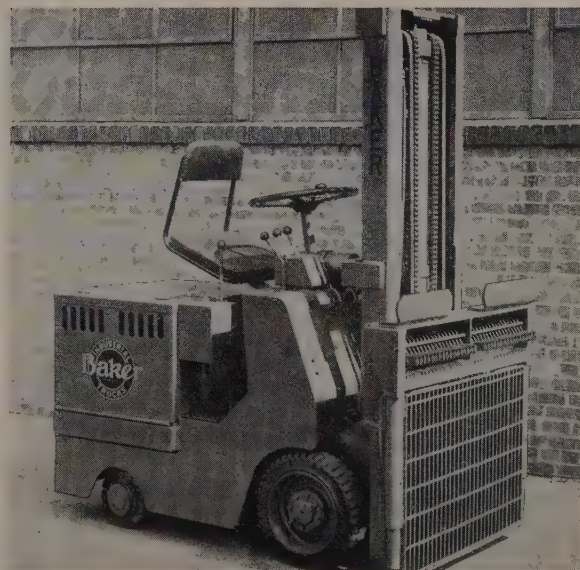
A finger lift device, plus a special addition, provides palletless handling of crates and drum-type cartons.

The finger lift attachment mounts 40 spring-loaded fingers across the top. As the attachment contacts a crate, the fingers which meet crate members are pushed back against their springs. Those which find no obstruction enter the crate. When the attachment is lifted, fingers engage crate members.

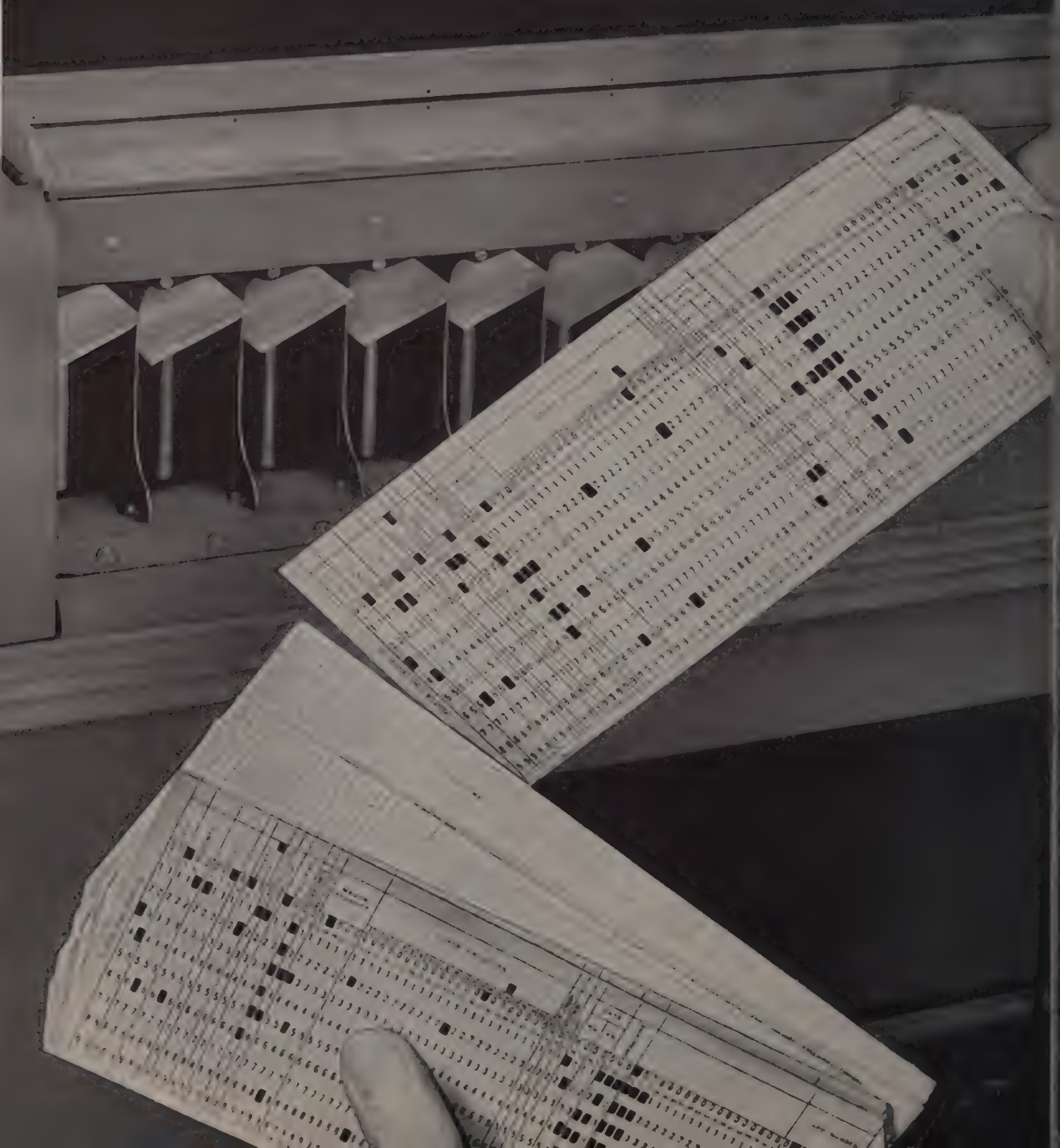
Two vertical, swiveled plates mounted above the fingers are used to pick up cap-and-tube or drum-type containers.

In this type container, about 4 in. of the container wall is folded outward at the top. The carton top, or cap, fits down over the fold, forming the carton lip.

Plates of the attachment slip between the wall and the fold when lifting. They are pivoted about their centers, making it easy to lift two cartons at once. Write: Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O. Phone: Olympic 1-3000



*There's nothing unique*





*... about punched cards*

Collecting market data on punched cards is not unusual today.

Using these cards as we do to match industrial publication coverage to the number of worthwhile establishments *is* unusual.

Reporting coverage figures to advertisers on the Standard Industrial Classification\* (S.I.C.) basis was distinctly a PENTON development. We are glad to see that more and more publishers are swinging over to this modern method of circulation analysis.

Plant counts will some day be required from all industrial publishers. Many progressive media buyers request them now. Without this information the advertiser is "flying blind" because he has no means of checking the number of worthwhile units covered (or missed) by a business magazine.

When you're using a PENTON publication you know how many worthwhile *units* are reached. Coverage reported on the S.I.C. basis enables you to measure it in relation to the total number of units. You can evaluate the proportion of the market buying power you are reaching, because information on size or type of establishments is also reported.

The ability to buy coverage in this modern way is just one of the extra values you get *when it's a PENTON publication.*

\*All manufacturers use this system in reporting to the U. S. Bureau of the Census.

*... but there is  
about the way  
PENTON  
uses them*



the P E N T O N

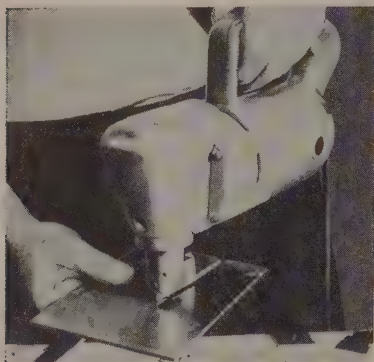
P u b l i s h i n g   C o m p a n y

PENTON BUILDING • CLEVELAND 13, OHIO

## Portable Nibbler

This 13-lb nibbler cuts stainless steel up to 10 gage, milder steels and nonferrous metal to 8 gage.

The tool cuts without distortion or excessive burring. It will follow patterns or templates and cut from any angle. It also cuts contoured or corrugated stock. Minimum cutting radius is 6 in.



Cutting action comes from a tool steel punch and die set which takes a 1/4-in. bite at each stroke. Speed at full load is 600 strokes a minute. Write: Fenway Machine Co., Edgemont and Clementine St., Philadelphia 34, Pa.

## Leak Checker

Molten or gaseous leaks in thermocouple protection tubes immersed in liquid materials are detected by this instrument.

It prevents inaccurate temperature readings and control in salt bath and melting furnaces.

The unit uses the conductivity of

molten or gaseous salt or metal to indicate leaks. A special warning circuit connects the thermocouple lead wire with the bath tank. Molten material leaking into the protection tube from the tank closes the circuit.

A warning light goes on when a button is pressed if a leak has closed the circuit. Write: Electronics Division, Peerless Electric Co., Warren, O. Phone: 3155-1

## Flooring

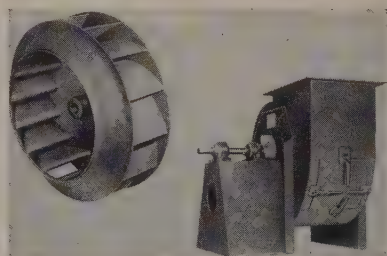
A dust-free, corrosion-resistant floor is formed by Metal-Flex. It withstands rapid changes in temperature and is oil and grease resistant.

Because of its low porosity, the floor holds destructive materials on its surface, assuring long life and easy cleaning. Write: Flexrock Co., 3630 Filbert St., Philadelphia 4, Pa. Phone: Baring 2-5500

## Centrifugal Fans

A backward-curve, nonoverloading fan is said to be 92-per-cent efficient. It operates on 35 per cent less power than needed by conventional, flat-blade fans. Noise level is reduced 65 per cent.

The hollow-sectioned, aerodynamic-shaped blades eliminate eddy currents.



Spun aerodynamic inlet cones reduce air turbulence and increase operating efficiency.

Wheel sizes are from 13 1/2 to 143 in. in diameter. Air deliveries are from 600 to 1 million cfm. Write: Chicago Blower Corp., 9869 Pacific Ave., Franklin Park, Ill. Phone: Gladstone 5-4780

## Aluminum Chain

Welded aluminum chain is non-sparking and nonmagnetic. It is extremely light and has excellent resistance to corrosion.

Size for size, its working load

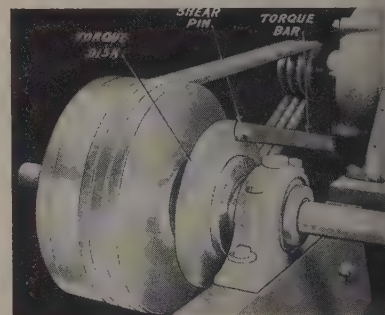
limit is about 60 per cent that of welded steel chain; its weight is 65 per cent less than steel chain.

It comes in color anodized finishes. Write: McKay Co., 330 McKay Bldg., Pittsburgh 22, Pa. Phone: Atlantic 1-5380

## V-Belt Pulley

This pulley eliminates the need for special auxiliary gear reduction units; it is equipped with built-in gear reductions.

Standard reductions range from 7:1 to 700:1; reductions of 8000:1 are available on special order.



The reduction pulley can be supplied as a plain speed reducer, with friction clutch added, or as a two-speed reducer clutch. It can be operated either horizontally or vertically. Write: Hart Reduction Pulley Co., 426 W. Main St., Waukesha, Wis. Phone: Division 2-7810

## Chain Hoist

An 11-lb midget hoist can lift 250 lb 30 ft in 1 minute.

It has a standard lift of 7 ft and a minimum distance of 9 in. between hooks.

Ball-bearing trolleys also are rated at 250 lb. They are made to fit 3 to 10 in. standard I-beams. The trolleys have carburized, hardened wheels and grease seals for protection from dust and dirt.

Diameter of the wheel tread is 2 1/4-in. The trolley weighs 12 lb. Write: Coffing Hoist Division, Duff-Norton Co., Danville, Ill.

## Resin Coating

Here is a coating, Glid-Iron, for maintaining and upgrading wood, metal and masonry surfaces.

It is highly resistant to chemicals and has excellent adhesion to wood, metal and concrete. It will

**Do you save  
money when  
you by-pass your  
distributor?**

**See Page No. 20**





**Heads above the crowd,** Anaconda Aerial Cable makes a fast, neat, low-cost installation at oil refinery.

## How to handle high voltage with a low overhead

**Anaconda Aerial Cable goes over crowded areas... gives highly reliable service at low cost.**

Pipes and other underground structures often make installation of ducts or buried cable costly and difficult. The ideal answer: Anaconda Aerial Cable.

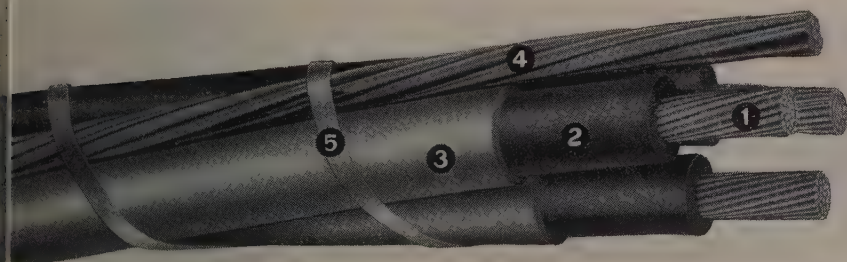
See how easy it is to install—no ducts, crossarms or insulators are needed. Even if underground obstructions are not a factor, this rugged neoprene-jacketed

cable costs much less than buried systems.

Neoprene jacket resists weather and abrasion. Special Anaconda Type AB butyl high-voltage insulation gives extra protection against ozone, heat, moisture and fumes.

For the full story, call the Man from Anaconda or your nearest Anaconda distributor. For information on Aerial Cable write to: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

56287



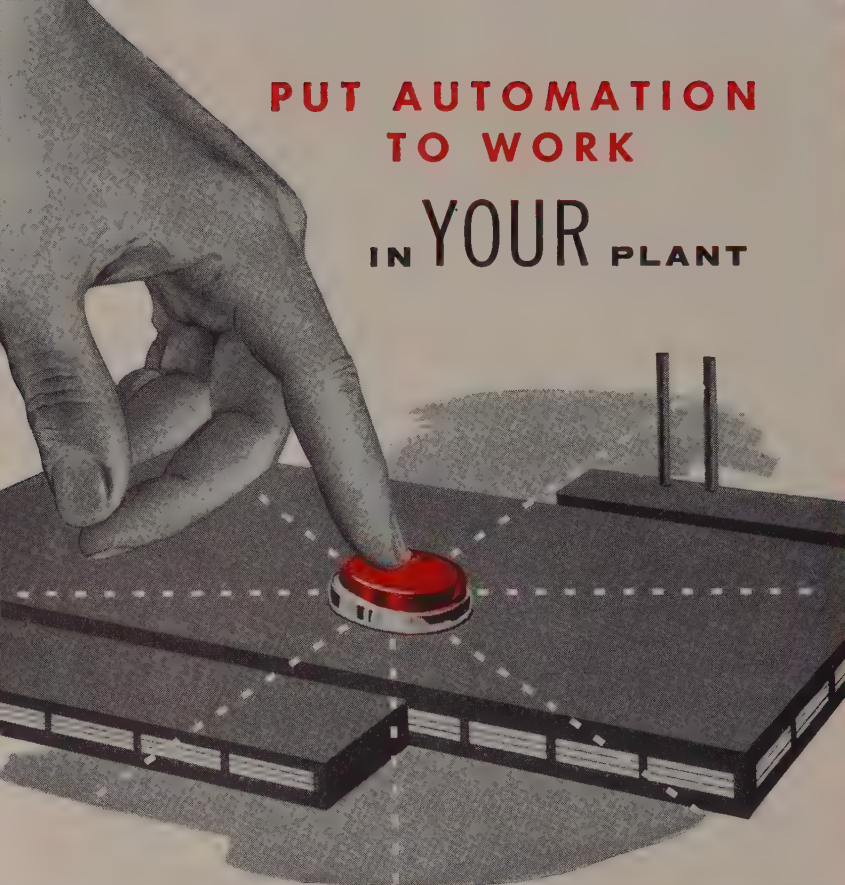
1. Conductors—copper or aluminum
2. Ozone-, moisture- and heat-resistant butyl insulation
3. Neoprene weather-resistant jacket
4. Messenger
5. Binder Tape

ASK THE MAN FROM **ANACONDA**<sup>®</sup>  
FOR AERIAL CABLE



**PUT AUTOMATION  
TO WORK**

**IN YOUR PLANT**



**WITH**



**AUTOMATIC  
PROCESS  
CONTROL**

Get the down-to-earth facts on Automation and Automatic Process Control for *your* needs. Act today; call in your nearby Pratt & Whitney Gage Specialist. This man has the knowledge and training to show you how you can improve your profit picture right now . . . AUTOMATICALLY. With more than 20 years of experience in Automation, the Pratt & Whitney Gage Department has successfully applied P&W Gages and Control Units to hundreds of machining, rolling, grinding and other processes. You can enjoy these same benefits.

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BRANCH OFFICES AND STOCK . . . BIRMINGHAM\* • BOSTON • CHICAGO  
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**NEW PRODUCTS**  
and equipment

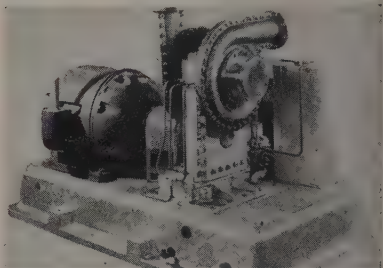
smooth out and bridge small cracks.

After curing overnight at normal room temperatures, it sets to a hard, tough, flexible and scuff resistant finish.

The material may be applied by spray, brush, roller or squeegee. It withstands temperatures from -20 to 212° F. Write: Glidden Co., Cleveland, O. Phone: Woodbine 1-8300

**Centrifugal Compressor**

Clean, oil-free air for instrument air systems, and process air comes from a new low-flow compressor.

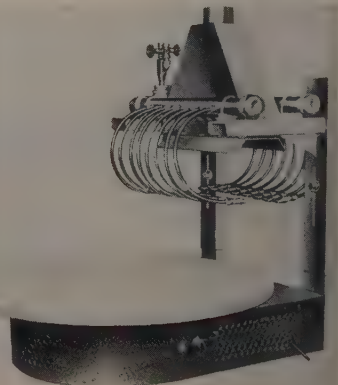


Various models give flows from 350 to 2000 cfm (static) delivered at 65-psi absolute. Low flow and high pressures are provided. Write: Sawyer Bailey Corp., 1559 Niagara St., Buffalo 13, N. Y. Phone: Summer 2300

**Turntable Heating Unit**

Small parts that need to be brazed, soldered, annealed or hardened are held by simple fixtures on this power-driven turntable.

As the turntable revolves, parts are passed between two rows of burner nozzles. Heat input is con-





# Uses Roof To Link Distant Departments

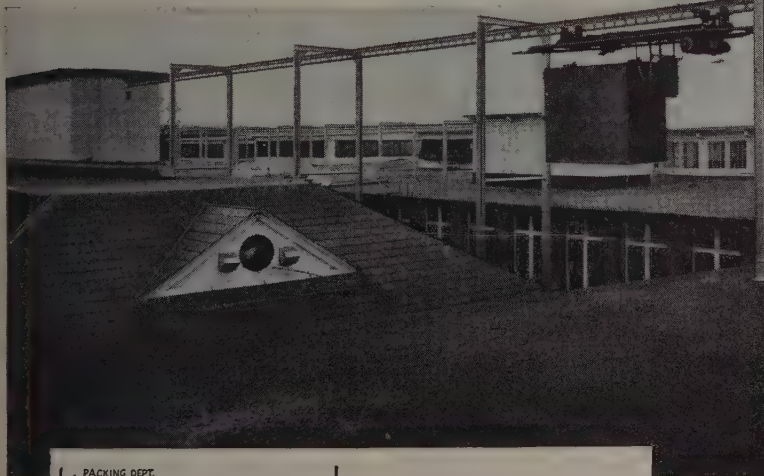
## Automatic Tramrail System Saves "240 Man-Hours" Per Week

By installing a Cleveland Tramrail automatic dispatch system that extends partly over roof tops and partly between buildings, the North Carolina Finishing Co., Salisbury, N. C., was able to successfully link two widely separated departments and secure the same advantages that would be obtained if they were adjacent to each other.

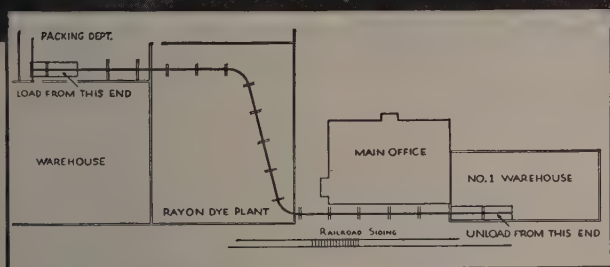
This system has been in operation since 1949. It is an excellent example of the application of a bit of imagination to overcome an awkward and costly materials handling situation. It reduces the time for movement of packaged rayon cloth from the Packing Department to the No. 1 Warehouse by 240 man-hours per week.

A wide variety of Cleveland Tramrail automatic dispatch systems is now serving industry. For real savings we suggest that you get the facts on this modern method of handling materials.

En route above the roof and approaching the penthouse above Warehouse No. 1. The carrier opens the penthouse doors which close after the unit has passed through. The Tramrail track is 28'-10" above the ground at the Warehouse.



6 to 8 cartons weighing 100 to 400 lbs. each are loaded into the Tramrail freight van. The button on wall, at left, sends the van on its way, first upward through ceiling opening, and then forward on outside roof track. The van measures 4'-0" x 8'-0" x 6'-6" high.



### GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

**CLEVELAND TRAMRAIL DIVISION**  
THE CLEVELAND CRANE & ENGINEERING CO.

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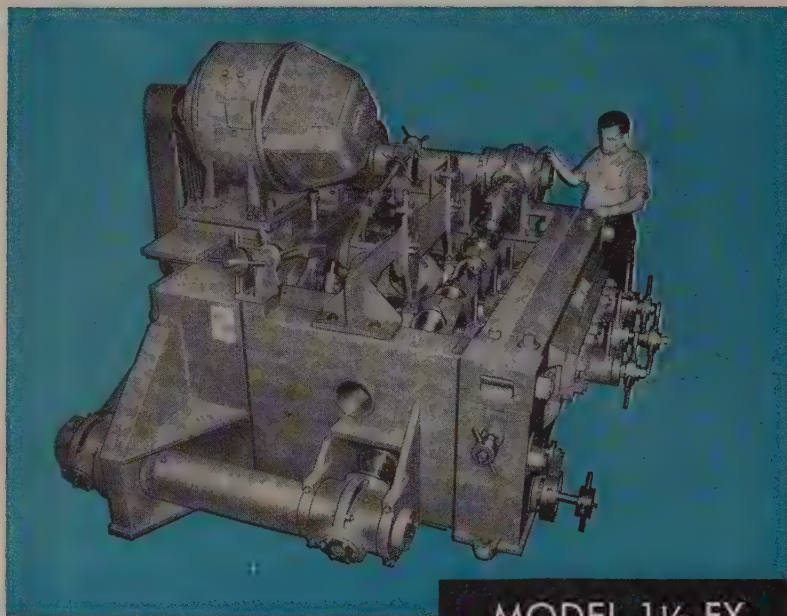
WICKLIFFE, OHIO



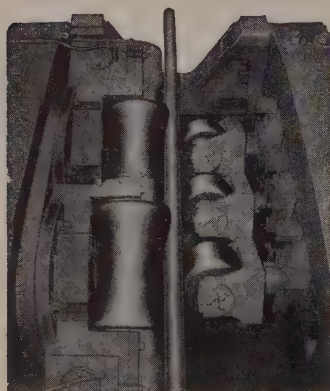
**CLEVELAND**  **TRAMRAIL**  
OVERHEAD MATERIALS HANDLING EQUIPMENT



# **HIGH SPEED** **SUTTON 5-Roll** **STRAIGHTENER AND POLISHER**



**FOR FAST AND ACCURATE  
STRAIGHTENING AND  
POLISHING OF COLD DRAWN  
ROUND BARS AND TUBES**



Ask for Bulletin No. 25

## **MODEL 1 1/2 FX**

(Pictured)

**BARS from**  
**5/16" to 2 1/2" Dia.**

**TUBES from**  
**5/16" O.D. to 3" O.D.**

**OTHER SIZES AVAILABLE**

- **DEPENDABLE SERVICE**
- **HIGH PRODUCTION**
- **QUALITY PERFORMANCE**

This Sutton model shows the flexibility of the 5-roll principle illustrated at left. While normally only two of the five rolls are driven, this machine has four driven rolls to provide a burnishing action which polishes as it straightens.

## **SUTTON Engineering COMPANY**

**Manufacturers for Ferrous and Non-Ferrous Metal Industries**

STRAIGHTENERS, EXTRUSION PRESSES, HYDRAULIC STRETCHERS, SHEET LEVELERS, CONTOUR CORRECTING MACHINES, STRAIGHTENING PRESSES, ROTARY CLEANERS, HEAVY-DUTY UNIVERSAL JOINTS, ROLLS

**FIRST NATIONAL BANK BLDG., PITTSBURGH 22, PENNSYLVANIA**

**PHONE: GRANT 1-8077**

**PLANT: BELLEFONTE, PA.**

## **NEW PRODUCTS** and equipment

trolled by a valve adjustment on the burner manifold. A variable speed drive on the turntable adjusts the heating time.

Flexible copper tubing makes it easy to adjust the nozzles. The manifold is adjustable both vertically and horizontally.

Commercial gas can be used. Write: Gas Appliance Service Inc., 1211 Webster Ave., Chicago 14, Ill. Phone: Diversey 8-5620

## **Silver Solder**

Two new alloys are for joining aluminum, copper, brass, bronze, stainless steel, steel, Monel and combinations of these and other metals.

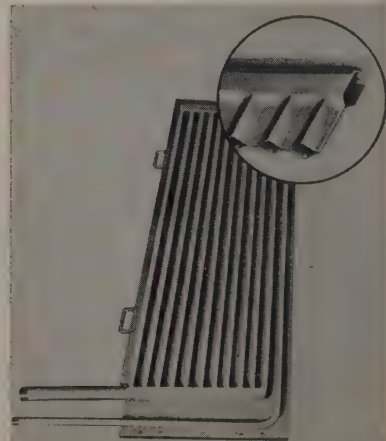
No. 105 medium temperature solder melts at 675° F and flows freely at 750° F. Its shear strength is 18,000 psi.

The other alloy, No. 107 general-purpose silver solder, melts at 450° F and flows freely at 600° F. It has excellent corrosion resistance and has a shear strength of 20,000 psi.

Both alloys are recommended for lap, sleeve and socket joints. Wire diameters are 1/16, 3/32 and 1/8-in. Write: All-State Welding Alloys Co. Inc., 249-55 Ferris Ave., White Plains, N. Y. Phone: White Plains 8-4646

## **Heat Transfer Units**

Embossed sheets of welded metal have pressure ratings of 150 lb. The safety factor is 1 to 4. The header-type, double-embossed units



**STEEL**



## NEW PRODUCTS and equipment

were rated at 100 lb.

Other ratings: 70 lb for single-embossed, header-type units; 125 lb for single-embossed serpentine coils; 200 lb for double-embossed serpentine units. Write: Tranter Mfg. Inc., Lansing 4, Mich. Phone: Ivanhoe 4-4531

### Electric Welders

Two lines of arc welders operate from single-phase power. Current can be controlled at the welding position.

The SRAC series is for metallic arc welding. Models come in 200, 300 and 400-amp ratings, with or without power factor correction.

The SRTA series is for inert gas and inert gas spot welding. Models are 200 or 300 amp and are power factor corrected. Both lines are for alternating or direct current.

The SRH welders are a direct-current rectifier type that conserves floor space. They are horizontal rather than upright.

They have a single current range and come in three models with 60 per cent duty cycle ratings of 200, 300 and 400 amp. Write: Miller Electric Mfg. Co. Inc., Appleton, Wis. Phone: Regent 3-6621

### Brazing Flux

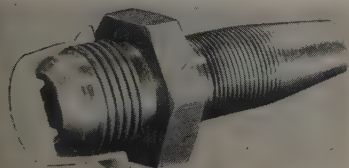
A high temperature flux meets the requirements for brazing of chrome and nickel alloys.

The flux is free flowing and active from 1400 to 2000° F. Write: Air Reduction Sales Co., division of Air Reduction Co. Inc., 60 E. 42nd St., New York 17, N. Y. Phone: Murray Hill 2-6700

### Thread Protector

This polyethylene, transparent cap is self-sealing. It protects the threads and flare face of fittings during shipment.

The plastic material is tough,

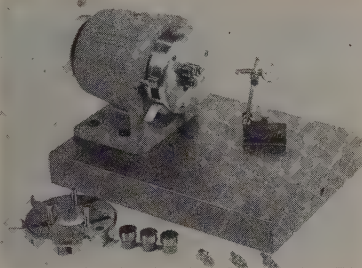


flexible, noncorrosive and impervious to all common chemicals and

oils. The caps will fit over 5/16 to 1-1/16-in. fittings. They will fit comparable sizes in tubing. Write: Plastic Division, Clover Industries Inc., 269 Clover Bldg., Young St., Tonawanda, N. Y. Phone: Ludlow 1331

### Gaging Fixture

The shoulder squareness relative to the centerline of threads is checked by this gage.



Readily interchangeable roll holding plates and gaging rolls give an inspection range from 1/4 to 1 1/2-in. thread diameter.

Accuracy is about 0.0002-in. at 1 1/2-in. diam. The fixture is used with an ordinary dial indicator.

The fixture consists of a gaging head mounted on a precision aligned spindle. Special thrust ball bearings insure squareness.

A hand crank rotates the spindle and head; errors in squareness are read easily on the indicator dial. Write: Pratt & Whitney Co. Inc., West Hartford 1, Conn. Phone: Adams 3-7561

### Lapping Machine

The exacting, figure-eight-motion hand lappers use to attain fine finishes is simulated by a lapping machine.

Where hand lappers work for long periods over lapping plates, stopping frequently to measure the finish, the machine does the job in a fraction of the time.

Optical flatness is obtained to 1 light band (0.0000116-in.).

A positive countermotion rotates parts to be lapped against the motion of the lapping plate for greater speed and accuracy. Write: Department PR31, Spitfire Tool Co., 2931 N. Pulaski Rd., Chicago 41, Ill. Phone: Palisade 5-1610

**PUNCHES ★ DIES ★ RIVET SETS ★ COMPRESSION RIVETER DIES**

52 Years making quality punches and dies. Our many customers throughout the nation repeat year after year because they know they can rely on our tools for consistent performance.

Write Dept. A for New Catalog 54

**GEO. F. MARCHANT COMPANY**  
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# **NEW** Literature

Write directly to the company for a copy

## **Heat Exchangers**

Performance data of convertors, instantaneous heaters and process equipment are presented by performance curves and examples. E. E. Cooley Co., 1186 Folsom St., San Francisco, Calif.

## **Furnace Linings**

Monolithic lining for industrial, foundry and steel mill furnaces is described in bulletin 69, 32 pages. Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.

## **Carbide Tools**

Here are suggestions on the selection of carbide tools. And a line of carbide tipped and solid carbide drills, reamers, end mills and counterbores is presented—36 pages. Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland 14, O.

## **Furnaces and Generators**

Electric and fuel-fired, heat-treating furnaces and atmosphere generators are described in a 17-page folder. Sargeant & Wilbur Inc., 180 Weeden St., Pawtucket, R. I.

## **High-Speed Steels**

Classification and symbols for identification of high-speed steels are given in a 32-page booklet. Le Vita Metal Alloy Co., 2980 W. Davison Ave., Detroit 38, Mich.

## **Tungsten Carbide**

Physical and chemical data on carbide grades for machining and die applications are given in a 4-page booklet. Dept. F-39, Adamas Carbide Corp., Kenilworth, N. J.

## **Industrial Clothing**

Gloves and protective clothing are listed in a 12-page catalog. Industrial Products Division, B. F. Goodrich Co., Akron, O.

## **Metal Hose**

Flexible hose products and coupling data are presented in a 12-page booklet. Flexonics Corp., 1371 S. Third Ave., Maywood, Ill.

## **Air Tools**

Assembly tools, drills, grinders and other portable tools are described—bulletin 53, 8 pages. Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 32, O.

## **Hydraulic Presses**

Presses for bending, cogging, flanging, forming, straightening and up-setting are covered in a 4-page bulletin. R. D. Wood Co., Public Ledger Bldg., Philadelphia 5, Pa.

## **Cemented Carbidcs**

Four charts give properties of carbidcs, including wear resistance and hardness. Sales Department, Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

## **Wire Flattening Mills**

Custom-engineered equipment for flattening ferrous, nonferrous and clad metal wire up to 1 in. in diameter is described—bulletin 731-R, 12 pages. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

## **Testing Machines**

Vertical and horizontal testing machines with capacities from 10,000 to 5 million lb are depicted—bulletin 4401, 12 pages. Testing Equipment Dept., Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

## **Electric Cable**

Here's a guide to the selection of insulated cable for many applications—bulletin 1096, 16 pages. Okonite Co., Passaic, N. J.

## **Surface Grinders**

Precision grinders for toolroom and production grinding are described in a 24-page bulletin. DoAll Co., Des Plaines, Ill.

## **Gage Blocks**

Linear and angular gage blocks and accessories, optical flats and temperature meters are covered—bulletin 56, 36 pages. Webber Gage Co., 12912 Triskett Rd., Cleveland 11, O.

## **Air Cylinders**

Cylinders with interchangeable mountings are depicted in a 12-page bulletin. Petch Mfg. Co., 463 York, Detroit 2, Mich.

## **Double-Faced Tapes**

A 4-page bulletin gives technical data and uses of industrial tapes. Advertising Services Department, Permacel Tape Corp., New Brunswick, N. J.

## **Compression Spring**

Here are design data on a spring that exerts the same force at any deflection—bulletin 313A-1-55, 16 pages. Flex'ator Division, Hunter Spring Co., Lansdale, Pa.

## **Tool Catalog**

Screw drivers, nut drivers, pliers, plastic mallets and specialty tools are presented—catalog SD-56, 40 pages. Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill.

## **Steel Piping**

The manufacture of steel pipe and its advantages are described in a 32-page booklet. Steel Plate Fabricators Association, 79 W. Monroe St., Chicago 3, Ill.

## **Diecasting Machines**

A line of diecasting machines is presented; charts indicate capacities for both zinc and aluminum. Dept. N-2, Lester Phoenix Inc., 2711 Church Ave., Cleveland, O.

## **Abrasive Separation**

Separators that handle from 33,000 to 320,000 lb of blast cleaning abrasive in an hour are described in bulletin 1003, 8 pages. Pangborn Corp., Hagerstown, Md.

## **Hardness Conversion Table**

A pocket-size celluloid card gives the approximate relationship between Brinell, Vickers, Rockwell and Shore Scleroscope hardness values and tensile strength. International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

## **Pressure Pipe**

Carbon, nickel and stainless tubular products for subzero temperature uses are specified—bulletin TB-357, 6 pages. Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa.

## **Electric Motors**

Motors built to the new NEMA standards (open drip-proof, enclosed and explosion proof) are presented in bulletin 1700. Louis Allis Co., Milwaukee 7, Wis.

## **Tube Mills**

Here is a description of the cold-forming, electric-weld process for making tube—64 pages. Yoder Co., Cleveland 2, O.

**Do you save  
money when  
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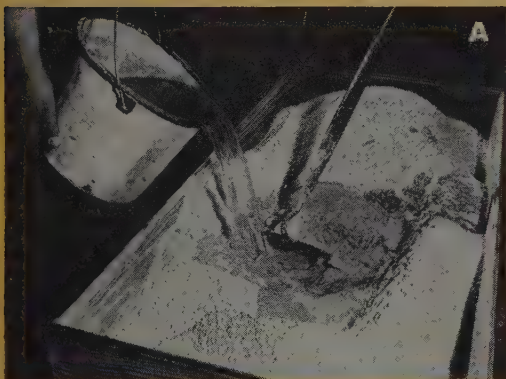
**See Page No. 20**



# NEW B&W

# 3200 degree

# Refractory Concrete



Today, in some types of heating and melting furnaces, complete linings or sections of linings are subjected to temperatures over 3000 F and, with the trend to higher and higher operating temperatures, the problem of finding the most economical refractories for this "over 3000 F service" will become even more important.

Now, with B&W's new Refractory Castable-3200, furnace builders and operators can cut installation costs by using castable construction for services up to 3200 F. As easy to use as other B&W refractory concretes, B&W Refractory Castable-3200 can be poured or trowelled into place or applied with a cement gun.

Several years ago, B&W developed Kaocast, the first successful 3000 degree refractory concrete, to lead this high temperature castable trend. B&W Castable-3200, like Kaocast, is made with an alumina-silica base and is recommended for temperatures from 2600 to 3200 F. Because of its very high temperature properties, it is not recommended for temperatures below 2600 F.

If you have not taken advantage of the fast, low cost installation of castables for your high temperature requirements, we suggest you investigate B&W Kaocast and the new B&W Castable-3200. Your local B&W Refractories Engineer has all the facts.

**A** Mixed like structural concrete, B&W Refractory Castable-3200 can be poured, trowelled or gunned into place. • **B** High temperature laboratory furnace lined with B&W Refractory Castable-3200.

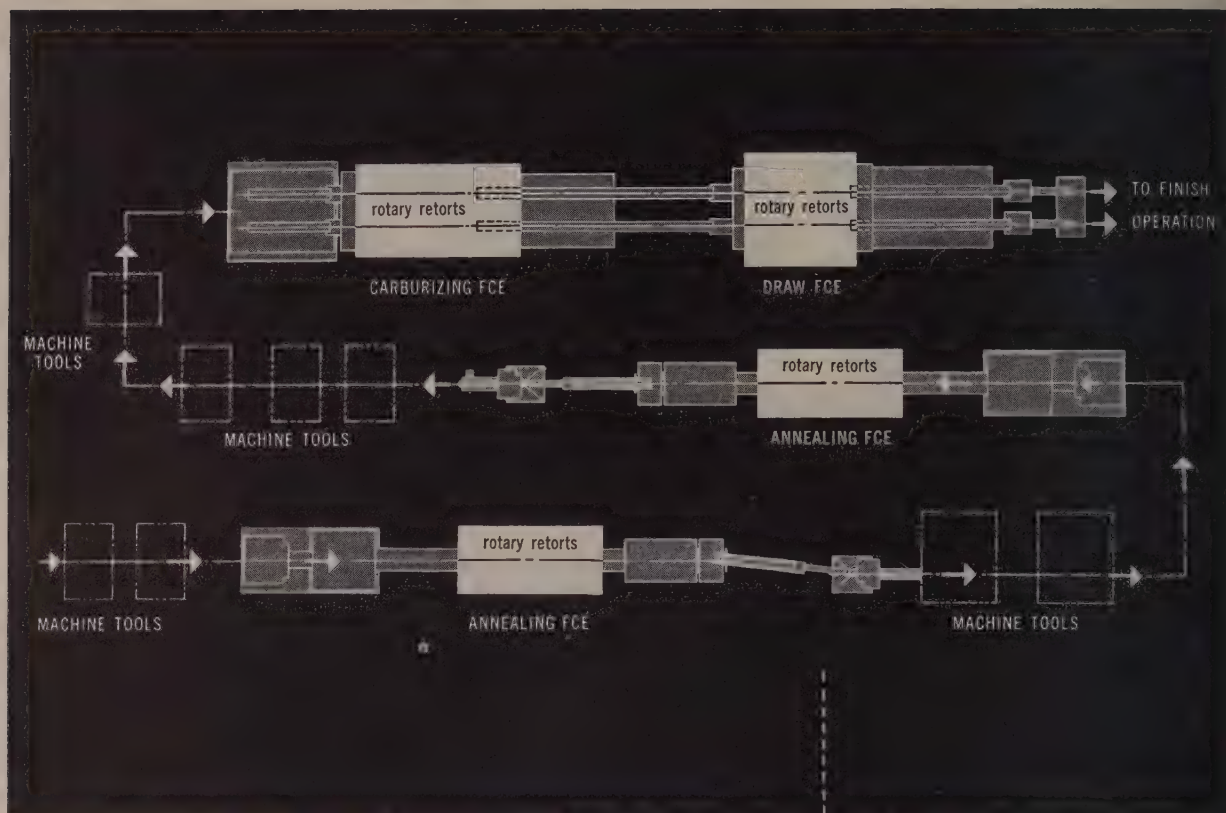
## BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.  
REFRATORIES DIVISION  
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WORKS: AUGUSTA, GA.

**B&W REFRACTORIES PRODUCTS:** B&W Allmul Firebrick • B&W 80 Firebrick  
B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars  
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Chemical Recovery Units • Seamless & Welded Tubes • Pulverizers • Fuel Burning Equipment  
Pressure Vessels • Alloy Castings



R-580



## 'Surface' lines 'em up

furnaces,  
machines,  
costs

There's more than one way to automate furnaces for high production, lower costs, and uniform quality—and 'Surface' engineers can show you a good many of them.

Dana Corporation, Marion Division, is a good illustration of the range of 'Surface' automation available. There you can see (1) different furnaces linked with machines at separate points on the line, (2) a self-contained automatic heat treat line within the production line, and (3) single furnace units with work handling completely automatic within each furnace.

Each of these types of automation results in higher production, more uniform quality, and lower handling costs than can be achieved in the conventional, isolated heat treat department. The point to remember is that these advantages aren't limited to high production plants; they can be applied to smaller operations as well. The sooner you apply them, the sooner they will pay off for you.

**Write for the Heat Treat automation story today, Bulletin H55-11**

**SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO**

Also makers of Janitrol automatic space heating and Kathabar humidity conditioning units





# Market Outlook

CONSUMERS' hopes for easier steel supply by the second quarter are encouraged by a slight dip in automotive requirements.

But they shouldn't count their chicks before they're hatched. Tonnage will not be much freer for several months. Auto builders are not likely to cut their mill order load sharply until the threat of a steel strike is removed—that means midyear at earliest. Further, there is such an excess of demand in the market that any slack will be quickly taken up.

**LESS CONVERSION**—Most market people agree the only reflections of automotive cutbacks in the steel market so far are in decreased conversion deals and orders at premium prices.

Buyers are interested in seeing how far the readjustments will spread. They want to know if products other than sheets, strip and bars will be affected. Plates and structurals are in extremely tight supply. An easing in demand for the lighter steel items should permit diversion of semifinished to production of the heavier products. Until that happens there is little chance for any real easing in over-all steel supply.

**TIGHT FIRST HALF**—Most buyers can come to only one conclusion: While they may get a little more steel than they expected in the first and second quarters, over-all supply will continue tight throughout the first half.

All indications point to continued heavy consumption. There will be large requirements for railroad equipment, line pipe, the oil and chemical industries, building and road construction and heavy industrial and electrical facilities. In

addition to construction, various consuming lines, such as canmaking and agriculture, will be stimulated seasonally. Auto production will get into high gear shortly.

**INVENTORIES SHORT**—Consumers' stocks, even by normal standards, are critically short. They need building up. Prospects for higher prices over coming months are bound to stimulate stock expansion. The possibility of a steel strike around midyear is certain to generate more protective covering than usual.

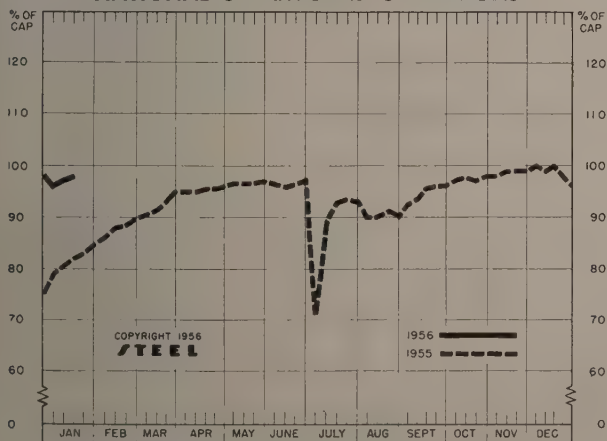
Some large steelmakers indicate they will start opening their second quarter order books late this month, or early in February.

**SCRAP WATCHED**—The sensational rise in scrap at Youngstown recently (No. 1 grades hit \$62 per ton on sales of production material to several mills) has caused considerable market uncertainty. Market forces are making a determined effort to prevent a runaway situation. In any case, prices in other areas have not been affected.

**OPERATIONS**—Reflecting strong demand and producers' efforts to get supply in balance with consumption as quickly as possible, the national ingot rate advanced 1 point last week to 98 per cent of capacity. A further rise is expected. A record-breaking total of 117,000,566 net tons of steel were produced in this country last year.

**PRICES**—Reflecting recent changes in such products as butt weld pipe and manufacturers bright wire, STEEL's arithmetical price composite on finished steel has advanced to \$128 from \$127.60.

### NATIONAL STEELWORKS OPERATIONS



### DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Jan. 15	Change	Same Week 1955	1954
Pittsburgh	100.5	+ 2.5	80	86
Chicago	97	- 2*	84	78.5
Mid-Atlantic	96	0	76	82
Youngstown	98	- 2	86	78
Wheeling	97.5	- 1	94.5	82
Cleveland	98	+ 1.5	96	88
Buffalo	105	0	100	65
Birmingham	95.5	+ 2	74	95
New England	94	+ 2	75	87
Cincinnati	86.5	- 2	83.5	69
St. Louis	99.5	+ 0.5	78	87
Detroit	105	+ 5	88	86.5
Western	103	0	76	77
National Rate	98	+ 1	82	74.5

### INGOT PRODUCTION†

	Week Ended Jan. 15	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	148.7†	149.6	150.7	124.9
NET TONS (In thousands)	2,388†	2,403	2,421	2,007

\*Change from preceding week's revised rate.  
†Estimated. ‡Amer. Iron & Steel Institute.  
Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

## Price Indexes and Composites

### FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 10 1956	Jan. 3 1956	Month Ago	Dec. Average
(1947-1949=100)	155.7	155.7	154.8	154.8

### AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 10

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parenthesis. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1 ..	\$4.900	Sheets, Electrical .....	\$10.175
Rails, Light, 40 lb .....	6.217	Strip, C.R., Carbon .....	8.293
Tie Plates .....	5.625	Strip, C.R., Stainless, 403	
Axles, Railway .....	8.000	(lb) .....	0.444
Wheels, Freight Car, 33		Strip, H.R., Carbon .....	5.406
in. (per wheel) .....	52.50	Pipe, Black, Buttweld (100	
Plates, Carbon .....	4.950	ft) .....	16.997
Structural Shapes .....	4.867	Pipe, Galv., Buttweld (100	
Bars, Tool Steel, Carbon		ft) .....	20.930
(lb) .....	0.460	Pipe, Line (100 ft) .....	187.167
Bars, Tool Steel Alloy, Oil		Casing, Oil Well, Carbon	
Hardening Die (lb) .....	0.580	(100 ft) .....	165.120
Bars, Tool Steel, H.R.,		Casing, Oil Well, Alloy	
Alloy, High Speed W		(100 ft) .....	244.670
6.75, Cr 4.5, V 2.1, Mo		Tubes, Boiler (100 ft) .....	39.470
5.5, C 0.60 (lb) .....	1.185	Tubing, Mechanical, Carbon	
Bars, Tool Steel, H.R.,		(lb) .....	20.980
Alloy, High Speed W-18,		Tubing, Mechanical, Stain-	
Cr 4, V 1 (lb) .....	1.680	less, 304 (100 ft) .....	178.897
Bars, H.R., Alloy .....	9.413	Tin Plate, Hot-dipped, 1.25	
Bars, H.R., Stainless, 303		lb .....	8.933
(lb) .....	0.450	Tin Plate, Electrolytic,	
Bars, H.R., Carbon .....	5.50	0.25 lb .....	7.633
Bars, Reinforcing .....	5.313	Black Plate, Canmaking	
Bars, C.E.F., Carbon .....	8.690	Quality .....	6.733
Bars, C.E.F., Alloy .....	12.175	Wire, Drawn, Carbon .....	8.675
Bars, C.E.F., Stainless, 302		Wire, Drawn, Stainless	
(lb) .....	0.469	430 (lb) .....	0.578
Sheets, H.R., Carbon .....	5.145	Bale ties (bundle) .....	6.473
Sheets, C.R., Carbon .....	6.214	Nails, Wire, 8d Common .....	8.585
Sheets, Galvanized .....	7.770	Wire, Barbed (80-rod spool)	
Sheets, C.R., Stainless,		Woven Wire Fence (20-rod	
302 (lb) .....	0.588	roll) .....	18.635

### STEEL's FINISHED STEEL PRICE INDEX\*

	Jan. 11 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)...	209.10	209.10	208.90	194.53	171.92
Index in cents per lb .....	5.665	5.665	5.659	5.270	4.657

### STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	\$128.00	\$128.00	\$127.68	\$117.95	\$105.55
No. 2 Fdry, Pig Iron, GT..	58.99	58.99	58.99	56.54	52.54
Basic Pig Iron, GT .....	58.49	58.49	58.49	56.04	52.16
Malleable Pig Iron, GT .....	59.77	59.77	59.77	57.27	53.27
Steelmaking Scrap, GT ....	53.33	52.17	50.17	35.00	45.50

\*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.  
†Revised.

## Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 11 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh ....	4.65	4.65	4.65	4.30	3.70
Bars, H.R., Chicago .....	4.65	4.65	4.65	4.30	3.70
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	4.18
Bars, C.E.F., Pittsburgh ....	5.90	5.90	5.90	5.40	4.85
Shapes, Std., Pittsburgh ....	4.60	4.60	4.60	4.25	3.65
Shapes, Std., Chicago .....	4.60	4.60	4.60	4.25	3.65
Shapes, deld., Philadelphia...	4.88	4.88	4.88	4.53	3.98
Plates, Pittsburgh .....	4.50	4.50	4.50	4.225	3.70
Plates, Chicago .....	4.50	4.50	4.50	4.225	3.70
Plates, Coatesville, Pa. ....	4.80	4.80	4.80	4.225	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.70
Plates, Claymont, Del. ....	4.80	4.80	4.80	4.225	4.15
Sheets, H.R., Pittsburgh ....	4.325	4.325	4.325	4.05	3.60-3.7
Sheets, H.R., Chicago .....	4.325	4.325	4.325	4.05	3.60
Sheets, C.R., Pittsburgh ....	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Chicago .....	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Detroit .....	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.55
Sheets, Galv., Pittsburgh ....	5.85	5.85	5.85	5.45	4.80
Strip, H.R., Pittsburgh ....	4.325	4.325	4.325	4.05	3.75-4.0
Strip, H.R., Chicago .....	4.325	4.325	4.325	4.05	3.50
Strip, C.R., Pittsburgh ....	6.25	6.25	6.25	5.75	4.65-5.3
Strip, C.R., Chicago .....	6.25-6.35	6.25-6.35	6.35	5.85	4.50-4.8
Strip, C.R., Detroit .....	6.35	6.35	6.35	5.90	4.35-5.6
Wire, Basic, Pittsburgh ....	6.80	6.80	6.25	5.75	4.85-5.1
Nails, Wire, Pittsburgh ....	7.60	7.60	7.60	6.85	5.90-6.2
Tin plate (1.50 lb), box, Pitts.	\$9.45	\$9.45	\$9.45	\$9.05	\$8.70

### SEMIFINISHED STEEL

Billets, Forging, Pitts. (NT)	\$84.50	\$84.50	\$84.50	\$78.00	\$66.00
Wire rods, $\frac{3}{8}$ -% Pitts. ....	5.025	5.025	5.025	4.675	4.10-4.3

### PIG IRON, Gross Ton

Bessemer, Pitts. ....	\$59.50	\$59.50	\$59.50	\$57.00	\$53.00
Basic, Valley .....	58.50	58.50	58.50	56.00	52.00
Basic, deld. Phila. ....	62.16	62.16	62.16	59.66	56.39
No. 2 Fdry, Pitts. ....	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Chicago .....	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Valley .....	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, deld. Phila. ....	62.66	62.66	62.66	56.16	56.89
No. 2 Fdry, Birm. ....	55.00	55.00	55.00	52.88	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.58
Malleable, Valley .....	59.00	59.00	59.00	56.50	52.50
Malleable, Chicago .....	59.00	59.00	59.00	56.50	52.50
Ferromanganese, Duquesne.	205.00†	205.00†	190.00†	190.00†	188.00

†74-76% Mn, net ton. \*75-82% Mn, gross ton, Etna, Pa.

### SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts. ....	\$54.50	\$51.00	\$50.00	\$36.50	\$46.50
No. 1 Heavy Melt, E. Pa. ....	55.00	55.00	50.00	33.50	45.00
No. 1 Heavy Melt, Chicago .....	50.50	50.50	50.50	35.00	45.00
No. 1 Heavy Melt, Valley .....	58.50	57.50	52.50	36.50	46.25
No. 1 Heavy Melt, Cleve. ....	54.50	54.50	50.50	33.50	45.75
No. 1 Heavy Melt, Buffalo. ....	47.50	45.50	45.50	30.50	44.88
Rails, Rerolling, Chicago ....	72.50	72.50	73.50	53.00	67.00
No. 1 Cast, Chicago .....	51.50	51.50	50.50	40.00	62.00

### COKE, Net Ton

Beehive, Furn, Connsvl. ....	\$14.125	\$14.125	\$13.625	\$13.75	\$14.75
Beehive, Fdry, Connsvl. ....	16.50	16.50	16.50	16.75	17.50
Oven, Fdry, Chicago .....	27.00	27.00	25.75	24.50	21.00

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

## Daily Nonferrous Price Record

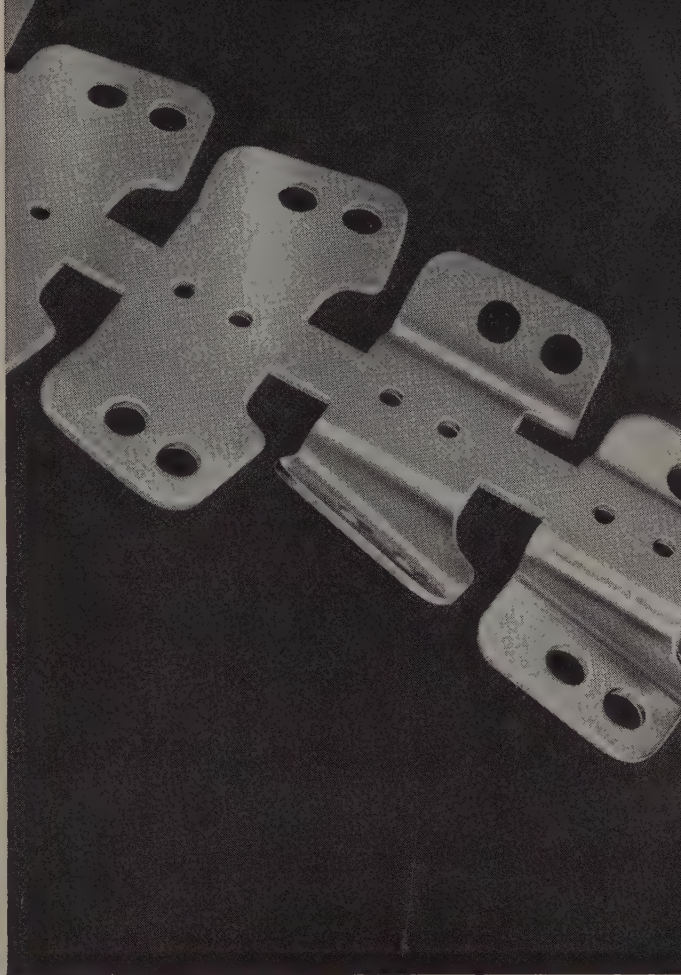
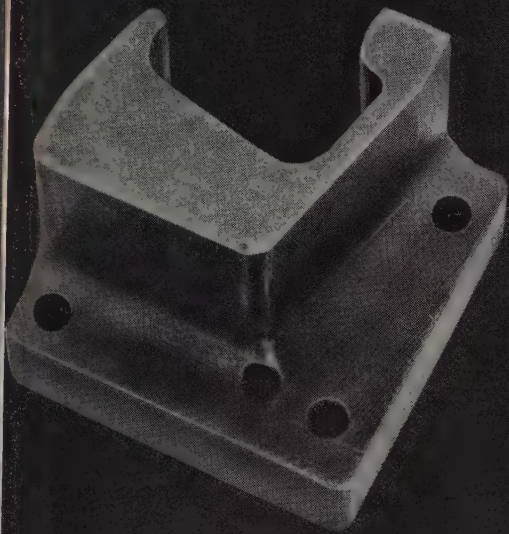
	Price Jan. 11	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1955 Avg.
Copper .....	43.00-50.25	Dec. 29, 1955	43.00-50.00	46.053	44.420	30.180
Lead .....	16.30	Jan. 4, 1956	15.80	15.358	15.300	14.800
Zinc .....	13.50	Jan. 6, 1956	13.00	13.000	13.000	11.500
Tin .....	106.375	Jan. 11, 1956	106.625	107.98	97.825	87.280
Nickel .....	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum .....	24.40	Aug. 8, 1955	23.20-24.40	24.400	24.400	22.900
Magnesium .....	32.50	Aug. 16, 1955	28.50	32.500	32.500	27.000

### What You Can Use the Markets Section for:

- A source of price information. Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- A directory of producing points. Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- A source of price data for making your own comparisons. Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- A source of information on market trends. Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- Reports on iron and steel production, and materials and product shipments.



## FIELD REPORT: NO. 90



## WHICH DIE STEEL WOULD YOU USE HERE to get this punch out of hardening in one piece?

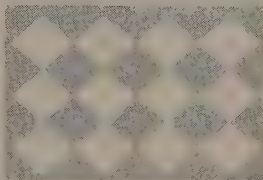
This punch blanks automotive stampings from SAE 1010 strip, .062" thick. It is so unbalanced in design that safety in hardening is vital in the die steel used. Since the punch is shear fitted to the die section before heat treating, accuracy in hardening is equally important. The punch is hardened to Rockwell C-61/62. All the steels tried either broke or changed size excessively.

If the decision were squarely in your lap, which die steel would you be willing to recommend?

Here's how the manufacturer solved the problem, as recorded in a Field Report from our customer: The Carpenter Matched Set Method showed that Carpenter VEGA (Air-Tough) Die Steel had the hardening safety and accuracy plus toughness demanded by the job. The punches are now coming through heat treatment "right on the nose," and production between grinds has jumped from about 10,000 to 50,000 parts. Further, the heat treater says VEGA is the easiest air-hardening steel he has ever worked with.

When the decision is up to you, rely on Carpenter for dependable results. For fast attention to your orders, call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor, today. The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.

### Your toolroom can use Carpenter Matched Tool and Die Steels to:



- Reduce hardening hazards
- Minimize machine downtime
- Boost output per grind
- Improve product quality

# Carpenter

**Matched Tool and Die Steels**

IMMEDIATE DELIVERY from local warehouse stocks — Export Address: Port Washington, N. Y. — "CARSTEEL.CO"





# Nonferrous Metals

**Price rises are taken philosophically by industry as lead and zinc markets remain firm. One cloud on the horizon: Automakers are cutting back some orders**

Nonferrous Metal Prices, Pages 110 & 111

LEAD AND ZINC continue to enjoy high level demand. The price hikes (lead to 16.50 cents a pound, zinc to 13.50) have been noted by industry, but there is little change in most metal buyers' attitudes except to approach the placing of advance orders with some caution.

**Lead**—One leading lead producer told STEEL: "The price hikes are not scaring away customers. We are booked solidly through January . . . We actually have turned down an order or two." Other lead men report that February sales are slow, but quickly point out that January is booked solidly. Crux: Most producers are experiencing sales which will keep the lead market firm at its present level. Buyers will order heavily for current needs but will tend to ignore future requirements.

**Zinc**—In October, an attempt to raise the price to 13.50 cents a pound ran into a stone wall of resistance. But when the London market went above the parity price of domestic zinc, there was no choice. After watching lead rise 1 cent a pound in a few days, domestic zinc producers made the move on Jan. 6. While there is no real shortage of zinc in this country, domestic users are partially dependent on foreign supplies, and the high London price soon would have diverted shipments from the U. S. into the European market.

Some observers are wondering if the General Services Administration will enter the market to buy lead and zinc for stockpile at the combined price of 30 cents a pound. There is a growing feeling that so long as the government eventually must stop buying for long-range stockpile, now would be a good time to do it. Reason: The '56 outlook for lead and zinc indicates that high level demand will continue.

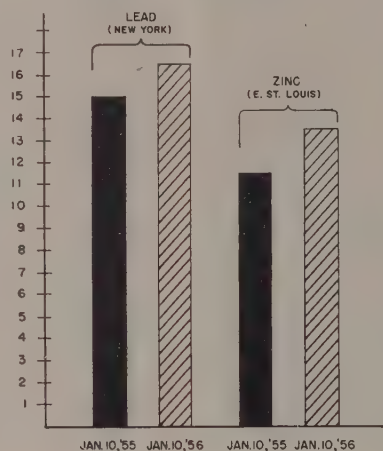
**Cause For Concern**—There may be a weak spot. Automakers are cutting back some orders. A successful year for lead and zinc is tied closely to car production.

## Nickel Production Climbs

"Free world nickel production is estimated at 442 million lb for 1956," says John F. Thompson, chairman, International Nickel Co. of Canada.

This will be an increase of some 15 million lb over last year's estimated production of 427 million lb. Last December's forecasts estimated that

**A Year of Price Increases**  
(Cents Per Pound)



free world nickel production for '55 would be only about 400 million lb.

Even with better than expected production last year, and increased nickel production slated for this year, there is still a long way to go before supply catches up with demand.

The Office of Defense Mobilization will conduct a thorough survey of the situation. Arthur S. Flemming, ODM director, has appointed John R. Townsend, director of materials and standard engineering, Sandia Corp., to study: 1. The current and prospective nickel supply. 2. What impact defense requirements are having on the civilian market. Mr. Townsend will delve into atomic energy and set-aside requirements, too. Hoped-for solution: Find a way to satisfy the cravings of the stockpile, military, atomic energy and civilian markets for nickel.

**Food for thought:** Will Mr. Townsend's report recommend that the U. S. or private industry get busy and build smelting and refining facilities at the U. S. Nicaro mines?

## Good Year for Brass

Herman W. Steinkraus, chairman and president, Bridgeport Brass Co., reports: "We look forward to the

current year with confidence that it has the potentiality of being the best in our 90-year history."

Mr. Steinkraus points to a stabilized economy and record employment as good omens. "Our economy," he explains, "is not based on a combination of heavy military expenditures, fear, inflation or high inventory accumulation." The only "if" to its best-year drive: Bridgeport will need a stable copper market and increased quantities of copper and aluminum to permit a higher rate of production for its mill products.

## Chilean Copper Strike Wanes

The Chilean copper strike called on Dec. 14 appears to be over. Reports from Chile were complicated last week as a general strike, protesting the government's move to curb inflation, was called about the time miners decided to go back to work. Anaconda miners returned on Jan. 6. Kennecott's miners waited a few more days and started to report back last week end. By Jan. 9 about 60 per cent of all workers were back. The general strike, which could tie up rail and dock facilities, is under control, says the Chilean government. Chile is under a mild form of martial law, and there are indications that the road to normal copper production may have a few more bumps in the offing.

## Market Memos

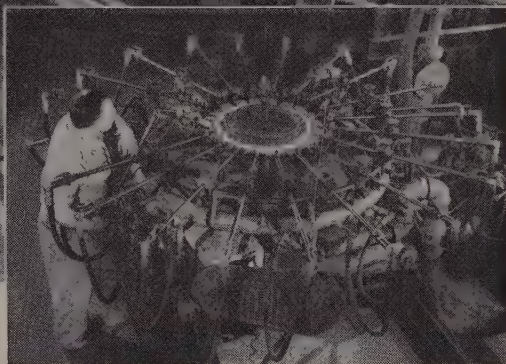
- Tin prices appear to be heading for a gentle decline. Many dealers would prefer to see the price at the 96-to-97-cent-a-pound level. But, they point out, tin prices are affected by political tensions from the Suez canal to Malaya.

- Aluminum had its second best month of 1955 in November, says the Aluminum Association. Primary production in November reached 267,377,623 lb, a gain of 24.8 million lb over the same month in 1954. The record month was October, when 269.3 million lb were produced.

- Rumor of the week: The price of nickel is going up.

- Zinc production in December reached an all-time high of 92,578 tons. Total shipments were 89,657, which resulted in an increase in stocks of slab zinc at the smelters to 40,979 tons. Even at that, stocks of prime western represent less than one month's supply, those of special high grade, a week's.





(Top) Heating a wide face shaft pinion for hardening with Sels Duradient burners at Baldwin-Lima-Hamilton. (Lower) Narrow face gear being heated by Sels Superheat burners at Wiedemann Machine Co.

## FUEL COST 11.4c PER 52-POUND GEAR *with Sels Heat Processing*

For hardening gears, pinions, segments, rollers, rings, shafts, cylinders, wheels and cams, Sels heat processing methods are unequalled for economy, speed and versatility. With equipment as shown above, for example, 52-lb. spur gears, with 24" pitch diameter and 1½" face, are tooth-hardened at a rate of 10 per hour, with a fuel cost of only 11.4c each.

Sels heating, using regularly-supplied fuels (manufactured gas, natural gas or propane), premixed with air . . . permits precise localized heating . . . to develop full surface hardness and controlled depth

of hardness. The operation can be fully automatic. Bottled oxygen is not required.

In heat treating, brazing, forging, strip annealing, and other continuous operations involving both ferrous and nonferrous metals, Sels Engineers can design heat processing equipment to help speed production, improve product quality and reduce manufacturing costs.

*Write for descriptive data concerning your heating requirements.*



# SELAS

**CORPORATION OF AMERICA  
PHILADELPHIA 34, PA.**



# Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

## PRIMARY METALS AND ALLOYS

**Aluminum:** 99 + % ingots 24.40; pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.  
**Aluminum Alloy:** No. 13, 12% Si, 26.20; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 2.780; No. 356, 7% Si, 0.3% Mg, 26.20.

**Antimony:** R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.  
**Beryllium:** 97%, lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.  
**Beryllium Aluminum:** 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa. Elmore, O.  
**Beryllium Copper:** 3.75-4.25% Be, \$43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.  
**Bismuth:** \$2.25 per lb ton lots.  
**Cadmium:** Sticks and bars \$1.70 per lb, deld.  
**Cobalt:** 97-99%, \$2.80 per lb for 550-lb keg; \$2.62 per lb for 100-lb case; \$2.67 per lb under 100 lb.

**Columbium:** Powder, \$119.20 per lb, nom.  
**Copper:** Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom, smelters, 50.00-50.25 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

**Germanium:** 99.9%, \$295 per lb, nom.  
**Gold:** U. S. Treasury, \$35 per oz.  
**Indium:** 99.9%, \$2.25 per troy oz.  
**Iridium:** \$100-\$120 nom, per troy oz.  
**Lead:** Common, 16.30, chemical, 16.40, cor-rod, 16.40, St. Louis, New York basis, add 0.20.  
**Lithium:** 99% +, cups or ingot, \$11.50; rod \$13.50; shot or wire, \$14.50, f.o.b. Minneapolis, 100 lb lots.

**Magnesium:** 99.8% self-palletizing pig, 32.50; notched ingot, 32.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

**Magnesium Alloys:** AZ91C and alloys C, G, H and R, 36.00; AZ91E, 31.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.  
**Mercury:** Open market, spot, New York, \$280-\$284 per 76-lb flask.

**Molybdenum:** Powder 99% hydrogen reduced, \$3-\$3.35 per lb; pressed ingot, \$4.06 per lb; sintered ingot, \$5.53 per lb.

**Nickel:** Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "P" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.  
**Osmium:** \$80-\$100, nom, per troy oz.  
**Palladium:** \$22-\$24 per troy oz.  
**Platinum:** \$97-\$117 per troy oz from refineries.  
**Radium:** \$16-\$21.50 per mg radium content, depending on quantity.

**Rhodium:** \$118-\$125 per troy oz.  
**Ruthenium:** \$45-\$55 per troy oz.  
**Selenium:** 99.5%, \$9-\$10 per lb.  
**Silver:** Open market, 90.50 per troy oz.  
**Sodium:** 16.50, c.l.; 17.00 l.c.l.

**Tantalum:** Sheet, rod, \$68.70 per lb; powder, \$56.63 per lb.  
**Tellurium:** \$1.76 per lb.  
**Thallium:** \$12.50 per lb.  
**Tin:** Straits, N. Y., spot, 106.375; prompt, 106.125.

**Titanium:** Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), \$3.45, grade A-2 (0.5% Fe max), \$3.15 per pound.  
**Tungsten:** Powder, 98.8%, carbon reduced, 1000-lb lots, \$4.30 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced \$4.85. Treated ingot, \$6.70.  
**Zinc:** Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade 15.25, deld.  
**Diecasting alloy ingot** No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

**Zirconium:** Ingots, commercial grade, \$14.40 per lb; low-hafnium reactor grade, \$23.07.  
**Sponge, commercial grade,** \$7.50-\$10.00 per lb, depending on quantity; reactor grade, \$14.00-\$22.00 per lb, depending on quantity. Powder, electronics grade, \$15 per lb; flash grade, \$11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

**Aluminum Ingot:** Piston alloys, 33.00-34.75; No. 12 foundry alloy (No. 2 grade) 32.00-32.25; 5% silicon alloy, 0.60 Cu max, 33.50-33.75; 13 alloy, 0.60 Cu max, 33.50-33.75; 195 alloy, 33.50-33.75; 108 alloy 32.00. Steel de-oxidizing grades notch bars, granulated or shot: Grade 1, 31.50-32.75; grade 2, 30.50-31.75; grade 3, 30.00-31.00; grade 4, 29.25-30.50.

**Brass Ingot:** Red brass No. 115, 42.00; tin bronze No. 225, 56.00; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 33.25; manganese bronze No. 421, 37.75.

**Magnesium Alloy Ingot:** AZ63A, 34.00; AZ91E, 34.00; AZ91C, 34.00; AZ92A, 34.00.

## NONFERROUS MILL PRODUCTS

**BERYLLIUM COPPER**  
(Base prices per lb, plus mill expense, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, \$1.84; rod, bar, wire, \$1.81.

### COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.83; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, \$22.00 per cwt; pipe, full coils, \$22.00 per cwt; traps and bends, list prices plus 30.00.

### TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$13.10-\$13.60; sheared mill plate, \$10.50-\$12.00; strip, \$13.10-\$13.60; wire, \$9.50-\$11.50; forging billets, \$7.90-\$8.15; hot-rolled and forged bars, \$7.90-\$8.15.

### ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00-24.00; ribbon zinc in coils, 20.50-21.50; plates 19.50-22.25.

### ZIRCONIUM

Plate, \$22; H.R. strip, \$19; C.R. strip, \$29; forged or H.R. bars, \$17; wire, 0.015 in., 1.00c per linear foot.

## NICKEL MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R. ....	102	83	99
Strip, C.R. ....	102	92	125
Plate, H.R. ....	97	87	95
Rod, Shapes, H.R. ..	87	74	93
Seamless Tubes ....	122	110	163
Shot, Blocks ....	...	71	...

## ALUMINUM

**Screw Machine Sheet:** 30,000 lb base.  
Diam. (in.) or —Round— —Hexagonal—  
across flats 2011-T3 2017-T4 2011-T3 2017-T4

Drawn	67.9	66.4	...	...
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2

Cold-finished	53.4	51.4	63.7	61.3
0.375-0.547	53.4	51.4	60.6	57.5
0.563-0.688	53.4	51.4	55.4	54.2
0.750-1.000	52.1	50.1	...	52.3
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	...	52.3

Rolled	48.8	46.9	...	...
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

## BRASS MILL PRICES

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube
Copper ....	63.13b	60.36c	...	63.32
Yellow Brass ....	52.27	42.14d	52.81	55.18
Red Brass, 85% ....	58.09	58.03	58.65	60.90
Low Brass, 80% ....	56.56	56.49	57.09	59.26
Naval Brass ....	55.63	49.94	52.89	55.79
Com. Bronze, 90% ....	60.18	60.12	60.72	62.74
Nickel Silver, 10% ....	66.00	68.33g	68.33	...
Phos. Bronze, A, 5% ....	80.99	81.49	82.67	...
Silicon Bronze ....	66.54	66.78	66.58	68.65e
Manganese Bronze ....	59.37	53.38	63.82	...
Muntz Metal ....	53.74	49.55	...	...

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

## ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.6	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.030	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.6
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0	...	39.4	45.4
0.016-0.015	43.9	...	40.2	46.6
0.014	44.9	...	41.2	47.9
0.013-0.012	46.1	...	41.9	48.9
0.011	47.1	...	43.1	50.5
0.010-0.0095	48.4	...	44.3	52.2
0.009-0.0085	49.7	...	45.8	54.3
0.008-0.0075	51.3	...	47.0	56.1
0.007	52.8	...	48.5	58.4
0.006	54.4	...	49.9	63.4

\*48 in. max diam. †26 in. max diam.

## ALUMINUM

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam, 72-240 in. length.	Plate Base	Circle Base
Alloy		
1100-F, 3003-F ....	36.5	40.8
5050-F .....	37.6	41.9
3004-F .....	38.6	43.8
5052-F .....	39.9	45.2
6061-T6 .....	41.1	46.0
2024-T4 .....	43.6	49.9
7075-T6 .....	51.4	58.5

\*24-48 in. widths or diam, 72-180 lengths.

## ALUMINUM

**Forging Stock:** Round, Class 1, 39.10-50.1 in specific lengths 38-144 in., diameters 0.375 to 8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick widths 0.750-10 in.

**Pipe:** ASA Schedule 40, alloy 6063-T6, 20-2 lengths, plain ends, 90,000-lb base, per 100 ft

Nom. Pipe Size (in.)	%	Nom. Pipe Size (in.)	%
1	26.80	2	51.9
1 1/2	35.85	6	143.0
1 3/4	42.90	8	256.7
			386.3

## MAGNESIUM

**Sheet:** AZ31, commercial grade, 0.032 in. 99.00; 0.064 in., 78.00; 0.125 in., 63.50, 30,000 lb and over, f.o.b. mill.

**Plate:** AZ31, 61.00, 30,000 lb or more, 0.254 in. and over, widths 24-60 in., lengths 72-180 in., tread plate, 64.00, 30,000 lb or more, 1/4 in. thick, widths 24-60 in., lengths 60-192 in., tooling plate 66.00, 30,000 lb or more, 0.250-3.000 in., widths 60-72 in., lengths 72-180 in.

**Extrusions:** AZ31 commercial grade, rectangles, 1/4 x 2 in., 64.70; 1 x 4 in., 69.50. Rod, 1 in., 61.50; 2 in., 59.00. Tubing, 1 in. OD x 0.065 in., 82.50. Angles, 1 x 1 x 1/4-in., 68.40; 2 x 2 x 1/4-in., 62.50. Channels, 6 in., 63.40. I-beams, 5 in., 62.70.

## NONFERROUS SCRAP

### DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

**Aluminum:** 1100 clippings, 20.00-20.50; old sheets 17.00-17.50; borings and turnings, 11.50-12.00; crankcases, 17.00-17.50; industrial castings 17.00-17.50.

**Copper and Brass:** No. 1 heavy copper and wire, 41.50-42.00; No. 2 heavy copper and wire, 37.50-38.50; light copper, 35.50-36.00; No. 1 composition red brass 32.00-32.50; No. 1 composition turnings, 31.00-31.50; yellow

## MILL PRODUCTS a

## SCRAP ALLOWANCES b

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper ....	63.13b	60.36c	...	63.32	39.000	39.000	38.250
Yellow Brass ....	52.27	42.14d	52.81	55.18	28.875	28.625	26.750
Red Brass, 85% ....	58.09	58.03	58.65	60.90	34.250	34.000	33.600
Low Brass, 80% ....	56.56	56.49	57.09	59.26	32.750	32.500	32.000
Naval Brass ....	55.63	49.94	52.89	55.79	28.750	28.500	28.000
Com. Bronze, 90% ....	60.18	60.12	60.72	62.74	35.750	35.500	35.000
Nickel Silver, 10% ....	66.00	68.33g	68.33	...	32.500	32.250	16.250
Phos. Bronze, A, 5% ....	80.99	81.49	82.67	...	39.250	39.000	38.000
Silicon Bronze ....	66.54	66.78	66.58	68.65e	37.875	37.625	37.875
Manganese Bronze ....	59.37	53.38	63.82	...	27.000	26.750	26.000
Muntz Metal ....	53.74	49.55	...	...	27.000	26.750	26.250

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.



brass turnings, 17.50-18.00; new brass clippings, 27.50-28.00; light brass, 19.00-19.50; heavy yellow brass, 22.00-22.50; new brass rod ends, 26.00-26.50; auto radiators, unsweated, 24.50-25.00; cocks and faucets, 24.50-25.00; brass pipe 25.00-25.50.

**Lead:** Heavy, 12.00-13.00; battery plates, 6.50-7.25; linotype and stereotype, 13.25-14.75; electrolyte, 12.00-13.00; mixed babbitt, 15.25.

**Magnesium:** Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

**Monel:** Clippings, 60.00-65.00; old sheets, 55.00-65.00; turnings, 50.00; rods, 59.50-65.00.

**Nickel:** Sheets and clips, 100.00-150.00; rolled anodes, 100.00-150.00; turnings, 85.00-125.00; rod ends, 100.00-150.00.

**Zinc:** Old zinc, 5.50-6.00; new die-cast scrap, 5.00-5.75; old die-cast scrap, 3.25-3.50.

#### REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

**Aluminum:** 1100 clippings, 25.00; 3003 clippings, 24.75-25.00; 6151 clippings, 24.50-25.00; 5052 clippings, 24.50-25.00; 2014 clippings, 24.00-24.50; 2017 clippings, 24.00-24.50; 2024 clippings, 24.00-24.50; mixed clippings, 24.00-24.50; old sheet, 20.00-22.00; old cast, 21.00-22.00; clean old cable (free of steel), 25.00; borings and turnings, 22.00-23.00.

**Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 65.00; light scrap, 60.00; turnings and borings, 43.00-55.00.

**Copper and Brass:** No. 1 heavy copper and wire, 41.50; No. 2 heavy copper and wire, 40.00; light copper 37.75; refinery brass (60% copper) per dry copper content, 38.00.

#### INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

**Copper and Brass:** No. 1 heavy copper and wire, 41.50; No. 2 heavy copper and wire, 40.00; light copper, 38.00; No. 1 composition borings, 33.50; No. 1 composition solids, 34.50; heavy yellow brass solids, 23.50; yellow brass turnings, 22.50; radiators, 26.50.

#### PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

#### ANODES

**Cadmium:** Special or patented shapes, \$1.70 per lb.

**Copper:** Flat-rolled, 59.79, oval, 58.92, 5000-10,000 lb; electrodeposited, 54.23, 2000-5000 lb lots; cast 59.54, 5000-10,000 lb quantities.

**Nickel:** Depolarized, less than 100 lb, \$1.015; 100-499 lb, 99.50; 500-999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

**Tin:** Bar or slab, less than 200 lb, \$1.255; 200-499 lb, \$1.240; 500-999 lb, \$1.235; 1000 lb or more, \$1.230.

**Zinc:** Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

#### CHEMICALS

**Cadmium Oxide:** \$2.15 per lb, in 100-lb drums. **Chromic Acid:** Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

**Copper Cyanide:** 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50. **Copper Sulphate:** 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

**Nickel Chloride:** 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 39.50; 10,000 lb and over, 33.50. All prices eastern delivery, effective Jan. 1, 1955.

**Nickel Sulphate:** 100 lb, 38.25; 200 lb, 36.25; 3300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

**Silver Cyanide:** (Cents per ounce) 4-oz bottle, 86.875; 16-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

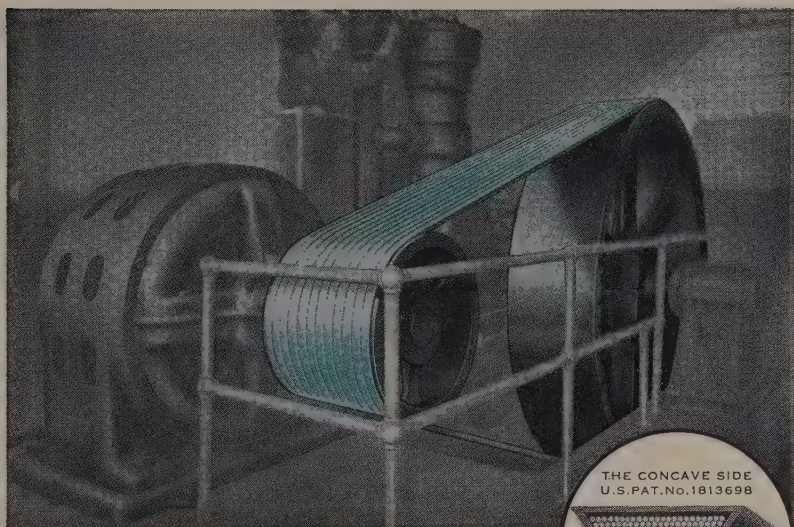
**Sodium Cyanide:** Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

**Sodium Stannate:** Less than 100 lb, 74.80; 100-600 lb, 66.10; 700-1900 lb, 63.60; 2000-9900 lb, 61.90; 10,000 lb or more, 60.70.

**Stannous Chloride (anhydrous):** Less than 25 lb, \$1.726; 25 lb, \$1.376; 100 lb, \$1.226; 400 lb, \$1.202; 5200-19,600 lb, \$1.080; 20,000 lb or more, 95.80.

**Stannous Sulphate:** Less than 50 lb, \$1.351; 50 lb, \$1.051; 100-1900 lb, \$1.031; 2000 lb or more, \$1.011.

**Zinc Cyanide:** Under 1000 lb, 54.30; 1000 lb and over, 52.30.



## Why a V-Belt with

# CONCAVE SIDES

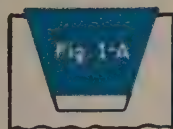
## wears longer

It is easy to demonstrate to yourself why the concave sides (Fig. 1) of the Gates belt greatly lengthen belt life.

Simply bend a Gates belt and feel the sides. Notice how these precisely engineered concave sides *fill out* on the bend and *become straight*. Thus a Gates belt grips the sheave groove evenly (Fig. 1-A) and wear is distributed uniformly across each side of the belt. That means longer belt life; lower costs.

Make the same test with a straight-sided belt (Fig. 2) and see what happens. The sides bulge out on the bend (Fig. 2-A) concentrating the wear at points shown by arrows.

To assure longer wear and keep belt costs down, specify the V-belt with concave sides—Gates Vulco Rope . . . readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado —*World's Largest Maker of V-Belts.*



*There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.*

TPA 68

# Gates V<sup>ULCO</sup> ROPE Drives



# Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 113. Key to footnotes, Page 115.

## SEMIFINISHED

INGOTS, Carbon, Forging (NT)  
Munhall, Pa. U5 .....\$69.50

INGOTS, Alloy (NT)  
Detroit R7 .....\$69.00  
Houston S5 .....74.00  
Midland, Pa. C18 .....69.00  
Munhall, Pa. U5 .....69.00

## BILLETS BLOOMS & SLABS

Carbon, Rolling (NT)

Alquippa, Pa. J5 .....\$68.50  
Bessemer, Pa. U5 .....68.50  
Bridgeport, Conn. N19 .....73.50  
Buffalo R2 .....68.50  
Clairton, Pa. U5 .....68.50  
Ensley, Ala. T2 .....68.50  
Fairfield, Ala. T2 .....68.50  
Fontana, Calif. K1 .....76.00  
Gary, Ind. U5 .....68.50  
Johnstown, Pa. B2 .....68.50  
Lackawanna, N.Y. B2 .....68.50  
LoneStar, Tex. L6 .....74.50  
Munhall, Pa. U5 .....68.50  
Pittsburgh J5 .....68.50  
S. Chicago, Ill. R2 U5 .....68.50  
S. Duquesne, Pa. U5 .....68.50  
Youngstown R2 .....68.50

## Carbon, Forging (NT)

Alquippa, Pa. J5 .....\$84.50  
Bessemer, Pa. U5 .....84.50  
Bridgeport, Conn. N19 .....89.50  
Buffalo R2 .....84.50  
Canton, O. R2 .....86.50  
Clairton, Pa. U5 .....84.50  
Conshohocken, Pa. A3 .....89.50  
Ensley, Ala. T2 .....84.50  
Fairfield, Ala. T2 .....84.50  
Fontana, Calif. K1 .....92.00  
Gary, Ind. U5 .....84.50  
Geneva, Utah C11 .....84.50  
Houston S5 .....89.50  
Johnstown, Pa. B2 .....84.50  
Lackawanna, N.Y. B2 .....84.50  
Los Angeles B3 .....94.00  
Midland, Pa. C18 .....84.50  
Munhall, Pa. U5 .....84.50  
Pittsburgh J5 .....84.50  
Seattle B3 .....98.00  
S. Chicago R2, U5, W14 .....84.50  
S. Duquesne, Pa. U5 .....84.50  
S. San Francisco B3 .....94.00

## Alloy, Forging (NT)

Bethlehem, Pa. B2 .....\$96.00  
Buffalo R2 .....96.00  
Canton, O. R2, T7 .....96.00  
Conshohocken, Pa. A3 .....103.00  
Detroit R7 .....96.00  
Fontana, Calif. K1 .....115.00  
Gary, Ind. U5 .....96.00  
Houston S5 .....101.00  
Ind. Harbor, Ind. Y1 .....96.00  
Johnstown, Pa. B2 .....96.00  
Lackawanna, N.Y. B2 .....96.00  
Los Angeles B3 .....116.00  
Massillon, O. R2 .....96.00  
Midland, Pa. C18 .....96.00  
Munhall, Pa. U5 .....96.00  
S. Chicago R2, U5, W14 .....96.00  
S. Duquesne, Pa. U5 .....96.00  
Struthers, O. Y1 .....96.00  
Warren, O. C17 .....96.00

## ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....\$103.50  
Canton, O. R2 .....103.50  
Cleveland R2 .....103.50  
Gary, Ind. U5 .....103.50  
S. Chicago R2, W14 .....103.50  
S. Duquesne, Pa. U5 .....103.50

## SKELP

Alquippa, Pa. J5 .....\$4.325  
LoneStar, Tex. L6 .....4.625  
Munhall, Pa. U5 .....4.225  
SparrowsPoint, Md. B2 .....4.225  
Warren, O. R2 .....4.225  
Youngstown R2, U5 .....4.225

## WIRE RODS

Alabama City, Ala. R2 .....\$5.375  
Alquippa, Pa. J5 .....5.025  
Alton, Ill. L1 .....5.20  
Buffalo B11 .....5.025  
Buffalo W12 .....5.375  
Cleveland A7 .....5.375  
Donora, Pa. A7 .....5.375  
Fairfield, Ala. T2 .....5.375  
Houston S5 .....5.275  
Indiana Harbor, Ind. Y1 .....5.025  
Johnstown, Pa. B2 .....5.025  
Joliet, Ill. A7 .....5.375  
Kokomo, Ind. Mo. S5 .....5.275  
Kokomo, Ind. C16 .....5.125

Los Angeles B3 .....\$5.825  
Minnequa, Colo. C10 .....5.275  
Monessen, Pa. P7 .....5.025  
N. Tonawanda, N.Y. B11 .....5.025  
Pittsburgh, Calif. C11 .....5.675  
Portsmouth, O. P12 .....5.025  
Roebling, N.J. R5 .....5.125  
S. Chicago, Ill. R2 .....5.375  
SparrowsPoint, Md. B2 .....5.025  
Sterling, Ill. (1) N15 .....5.025  
Sterling, Ill. N15 .....5.125  
Struthers, O. Y1 .....5.025  
Worcester, Mass. A7 .....5.675

## STRUCTURALS

### Carbon Steel Std. Shapes

Ala. City, Ala. R2 .....\$4.60  
Alquippa, Pa. J5 .....4.60  
Bessemer, Ala. T2 .....4.60  
Bethlehem, Pa. B2 .....4.65  
Birmingham C15 .....5.10  
Clairton, Pa. U5 .....4.60  
Fairfield, Ala. T2 .....4.60  
Fontana, Calif. K1 .....4.60  
Geneva, Utah C11 .....4.60  
Houston S5 .....4.70  
Ind. Harbor, Ind. I-2 .....4.60  
Johnstown, Pa. B2 .....4.65  
Kansas City, Mo. S5 .....4.70  
Lackawanna, N.Y. B2 .....4.65  
Los Angeles B3 .....5.30  
Minnequa, Colo. C10 .....4.90  
Munhall, Pa. U5 .....4.60  
Niles, Calif. P1 .....5.25  
Portland, Ore. O4 .....5.35  
Phoenixville, Pa. P4 .....5.15  
Seattle B3 .....5.35  
S. Chicago R2, U5, W14 .....4.60  
S. San Francisco B3 .....5.25  
Torrance, Calif. C11 .....5.30  
Weirton, W. Va. W6 .....4.60

### Wide Flange

Bethlehem, Pa. B2 .....\$4.65  
Clairton, Pa. U5 .....4.60  
Fontana, Calif. K1 .....5.40  
Lackawanna, N.Y. B2 .....4.65  
Munhall, Pa. U5 .....4.60  
Phoenixville, Pa. P4 .....5.15  
S. Chicago, Ill. U5 .....4.60

### Alloy Std. Shapes

Clairton, Pa. U5 .....\$5.65  
Fontana, Calif. K1 .....7.30  
Gary, Ind. U5 .....5.65  
Houston S5 .....5.75  
Munhall, Pa. U5 .....5.65  
S. Chicago, Ill. U5 .....5.65

### H.S., L.A. Std. Shapes

Alquippa, Pa. J5 .....\$6.75  
Bessemer, Ala. T2 .....6.75  
Bethlehem, Pa. B2 .....6.80  
Clairton, Pa. U5 .....6.75  
Fairfield, Ala. T2 .....6.75  
Fontana, Calif. K1 .....7.40  
Gary, Ind. U5 .....6.75  
Geneva, Utah C11 .....6.75  
Houston S5 .....6.85  
Ind. Harbor, Ind. I-2, Y1 .....6.80  
Johnstown, Pa. B2 .....6.80  
Kansas City, Mo. S5 .....6.85  
Lackawanna, N.Y. B2 .....6.80  
Los Angeles B3 .....7.45  
Munhall, Pa. U5 .....6.75  
Seattle B3 .....7.50  
S. Chicago, Ill. U5, W14 .....6.75  
S. San Francisco B3 .....7.40  
Struthers, O. Y1 .....6.75

### H.S., L.A. Wide Flange

Bethlehem, Pa. B2 .....\$6.80  
Lackawanna, N.Y. B2 .....6.80  
Munhall, Pa. U5 .....6.75  
S. Chicago, Ill. U5 .....6.75

## PILING

### BEARING PILES

Bethlehem, Pa. B2 .....\$4.65  
Lackawanna, N.Y. B2 .....4.65  
Munhall, Pa. U5 .....4.60  
S. Chicago, Ill. U5 .....4.60

### STEEL SHEET PILING

Ind. Harbor, Ind. I-2 .....\$5.45  
Lackawanna, N.Y. B2 .....5.45  
Munhall, Pa. U5 .....5.45  
S. Chicago, Ill. U5 .....5.45

## PLATES

### PLATES, Carbon Steel

Ala. City, Ala. R2 .....\$4.50  
Alquippa, Pa. J5 .....4.50  
Ashland, Ky. (15) A10 .....4.50  
Bessemer, Ala. T2 .....4.50  
Bridgeport, Conn. N19 .....4.75  
Buffalo R2 .....4.50  
Clairton, Pa. U5 .....4.50  
Claymont, Del. C22 .....4.80  
Cleveland J5, R2 .....4.60  
Coatesville, Pa. L7 .....4.80  
Conshohocken, Pa. A3 .....4.50  
Detroit M1 .....4.60  
Ecorse, Mich. G5 .....4.60  
Fairfield, Ala. T2 .....4.50  
Fairless Hills, Pa. (9) U5 .....4.80  
Fontana, Calif. (30) K1 .....5.15  
Gary, Ind. U5 .....4.50  
Geneva, Utah C11 .....4.70  
Granite City, Ill. G4 .....4.70  
Harrisburg, Pa. P4 .....5.10  
Houston S5 .....4.60  
Ind. Harbor, Ind. I-2, Y1 .....4.50  
Johnstown, Pa. B2 .....4.50  
Lackawanna, N.Y. B2 .....4.50  
LoneStar, Tex. L6 .....4.85  
Mansfield, O. E6 .....4.50  
Minnequa, Colo. C10 .....5.35  
Munhall, Pa. U5 .....4.50  
Newport, Ky. N9 .....4.50  
Pittsburgh J5 .....4.50  
Riverdale, Ill. A1 .....4.75  
Seattle B3 .....4.50  
Sharon, Pa. S3 .....4.60  
S. Chicago R2, U5, W14 .....4.50  
SparrowsPoint, Md. B2 .....4.50  
Steubenville, O. W10 .....4.50  
Warren, O. R2 .....4.50  
Weirton, W. Va. W6 .....4.50  
Youngstown R2, U5, Y1 .....4.50

### PLATES, Carbon Abras. Resist.

Claymont, Del. C22 .....\$5.65  
Fontana, Calif. K1 .....6.30  
Geneva, Utah C11 .....5.65  
Johnstown, Pa. B2 .....5.65  
SparrowsPoint, Md. B2 .....5.65

### PLATES, Wrought Iron

Economy, Pa. B14 .....\$10.40

### PLATES, High-Strength Low-Alloy

Alquippa, Pa. J5 .....\$6.725  
Bessemer, Ala. T2 .....6.725  
Clairton, Pa. U5 .....6.725  
Cleveland J5, R2 .....6.725  
Claymont, Del. C22 .....6.725  
Coatesville, Pa. L7 .....7.025  
Conshohocken, Pa. A3 .....6.725  
Ecorse, Mich. G5 .....6.825  
Fairfield, Ala. T2 .....6.725  
Fontana, Calif. (30) K1 .....7.375  
Gary, Ind. U5 .....6.725  
Geneva, Utah C11 .....6.725  
Houston S5 .....6.825  
Ind. Harbor, Ind. I-2, Y1 .....6.725  
Johnstown, Pa. B2 .....6.725  
Munhall, Pa. U5 .....6.725  
Pittsburgh J5 .....6.725  
Seattle B3 .....6.725  
Sharon, Pa. S3 .....6.725  
S. Chicago, Ill. U5, W14 .....6.725  
SparrowsPoint, Md. B2 .....6.725  
Youngstown U5, Y1 .....6.725

### PLATES, Alloy

Bridgeport, Conn. N19 .....\$6.55  
Claymont, Del. C22 .....6.30  
Coatesville, Pa. L7 .....6.30  
Fontana, Calif. K1 .....6.95  
Gary, Ind. U5 .....6.30  
Houston S5 .....6.40  
Ind. Harbor, Ind. Y1 .....6.30  
Johnstown, Pa. B2 .....6.30  
Munhall, Pa. U5 .....6.30  
Newport, Ky. N9 .....6.30  
Seattle B3 .....7.20  
Sharon, Pa. S3 .....6.30  
S. Chicago, Ill. U5, W14 .....6.30  
SparrowsPoint, Md. B2 .....6.30  
Youngstown Y1 .....6.30

### FLOOR PLATES

Cleveland J5 .....\$5.75  
Conshohocken, Pa. A3 .....5.75  
Harrisburg, Pa. P4 .....5.75  
Ind. Harbor, Ind. I-2 .....5.75  
Munhall, Pa. U5 .....5.75  
S. Chicago, Ill. U5 .....5.75

### PLATES, Ingot Iron

Ashland c.l. (15) A10 .....\$4.75  
Ashland l.c.l. (15) A10 .....5.25  
Cleveland c.l. R2 .....5.10  
Warren, O. c.l. R2 .....5.10

## BARS

### BARS, Hot-Rolled Carbon

Ala. City, Ala. (9) R2 .....\$4.65  
Alquippa, Pa. J5 .....4.65  
Alton, Ill. L1 .....4.85  
Atlanta A11 .....4.85  
Bessemer, Ala. (9) T2 .....4.65  
Birmingham C15 .....5.15  
Bridgeport, Conn. N19 .....4.65  
Buffalo (9) R2 .....4.75  
Canton, O. (9) R2 .....4.65  
Clairton, Pa. (9) U5 .....4.65  
Cleveland (9) R2 .....4.65  
Ecorse, Mich. G5 .....4.75  
Emeryville, Calif. J7 .....5.40  
Fairfield, Ala. (9) T2 .....4.65  
Fairless Hills, Pa. (9) U5 .....4.80  
Fontana, Calif. K1 .....5.35  
Gary, Ind. (9) U5 .....4.65  
Houston S5 .....4.90  
Ind. Harbor, Ind. (9) I-2 .....4.65  
Ind. Harbor, Ind. Y1 .....4.65  
Joliet, Ill. P22 .....5.15  
Joliet, Ill. P22 .....5.15  
Kansas City, Mo. S5 .....4.90  
Lackawanna, N.Y. B2 .....4.65  
Los Angeles B3 .....5.35  
Massillon, O. (9) R2 .....4.75  
Midland, Pa. C18 .....4.65  
Munhall, Pa. U5 .....4.65  
Minnequa, Colo. C10 .....5.10  
Niles, Calif. P1 .....5.35  
N. Tonawanda, N.Y. B11 .....4.65  
Pittsburgh J5 .....4.65  
Pittsburgh J5 .....4.65  
Portland, Ore. O4 .....5.40  
Seattle B3 .....5.40  
S. Chicago W14 .....4.65  
S. Chicago, Ill. (9) R2, U5 .....4.65  
S. Duquesne, Pa. (9) U5 .....4.65  
S. San Fran., Calif. B3 .....5.40  
Sterling, Ill. (1) N15 .....4.65  
Sterling, Ill. N15 .....4.75  
Struthers, O. Y1 .....4.65  
Torrance, Calif. (9) C11 .....5.35  
Warren, O. (9) R2 .....4.65  
Weirton, W. Va. W6 .....4.65  
Youngstown (9) R2 .....4.65  
Youngstown (9) U5 .....4.65

### BARS, H.R. Lead Alloy

Warren, O. C17 .....\$6.325

### BARS, Hot-Rolled Alloy

Bethlehem, Pa. B2 .....\$5.75  
Bridgeport, Conn. N19 .....5.725  
Buffalo R2 .....5.75  
Canton, O. R2, T7 .....5.75  
Clairton, Pa. U5 .....5.75  
Detroit R7 .....5.75  
Ecorse, Mich. G5 .....5.75  
Fontana, Calif. K1 .....6.625  
Fairless Hills, Pa. U5 .....5.75  
Gary, Ind. U5 .....5.75  
Houston S5 .....5.825  
Ind. Harbor, Ind. I-2, Y1 .....5.75  
Johnstown, Pa. B2 .....5.75  
Kansas City, Mo. S5 .....5.825  
Lackawanna, N.Y. B2 .....5.75  
Los Angeles B3 .....6.625  
Massillon, O. R2 .....5.75  
Midland, Pa. C18 .....5.75  
S. Chicago R2, U5, W14 .....5.75  
S. Duquesne, Pa. U5 .....5.75  
Struthers, O. Y1 .....5.75  
Warren, O. C17 .....5.75  
Youngstown U5 .....5.75

### BARS & SMALL SHAPES, H.R.

High-Strength Low-Alloy  
Alquippa, Pa. J5 .....\$6.80  
Bessemer, Ala. T2 .....6.80  
Bethlehem, Pa. B2 .....6.80  
Clairton, Pa. U5 .....6.80  
Cleveland R2 .....6.80  
Ecorse, Mich. G5 .....6.90  
Fairfield, Ala. T2 .....6.80  
Fontana, Calif. K1 .....7.50  
Gary, Ind. U5 .....6.80  
Houston S5 .....7.05  
Ind. Harbor, Ind. I-2, Y1 .....6.80  
Ind. Harbor, Ind. B2 .....6.80  
Kansas City, Mo. S5 .....7.05  
Lackawanna, N.Y. B2 .....6.80  
Los Angeles B3 .....7.50  
Pittsburgh J5 .....6.80  
Seattle B3 .....7.55  
S. Chicago W14 .....6.80  
S. Duquesne, Pa. U5 .....6.80  
S. San Francisco B3 .....7.55  
Struthers, O. Y1 .....7.55  
Warren, O. R2 .....6.80  
Youngstown U5 .....6.80

### BAR SIZE ANGLES; H.R. Carbon

Bethlehem, Pa. B2 .....\$4.80  
Ecorse, Mich. G5 .....4.75  
Emeryville, Calif. J7 .....5.40  
Fairfield, Ala. T2 .....4.65  
Fairless Hills, Pa. U5 .....4.80  
Fontana, Calif. K1 .....5.35  
Joliet, Ill. P22 .....5.10  
Niles, Calif. P1 .....5.35  
Pittsburgh J5 .....4.65

### BAR SIZE ANGLES; S. Shapes

Alquippa, Pa. J5 .....\$4.65  
Alton, Ill. L1 .....4.85  
Atlanta A11 .....4.85  
Bessemer, Ala. (9) T2 .....4.65  
Birmingham C15 .....5.15  
Buffalo R2 .....4.65  
Cleveland R2 .....4.65  
Ecorse, Mich. G5 .....4.75  
Emeryville, Calif. J7 .....5.40  
Fairfield, Ala. T2 .....4.65  
Fairless Hills, Pa. U5 .....4.80  
Fontana, Calif. K1 .....5.35  
Joliet, Ill. P22 .....5.10  
Niles, Calif. P1 .....5.35  
Pittsburgh J5 .....4.65

Portland, Ore. O4 .....\$5.40  
San Francisco S7 .....5.05

### BAR SHAPES, Hot-Rolled Alloy

Clairton, Pa. U5 .....\$5.65  
Gary, Ind. U5 .....5.65  
Houston S5 .....5.90  
Kansas City, Mo. S5 .....5.90  
Youngstown U5 .....5.65

### BARS, C.F. Lead Alloy

Ambridge, Pa. W18 .....\$3.25  
Camden, N.J. P13 .....3.35  
Chicago W18 .....3.25  
Cleveland C20 .....3.25  
Monaca, Pa. S17 .....3.25  
Newark, N.J. W18 .....8.50  
Spring City, Pa. K3 .....3.30  
Warren, O. C17 .....3.25

### BARS, Cold-Finished Carbon

Ambridge, Pa. W18 .....\$6.25  
Beaver Falls, Pa. M12, R2 .....6.90  
Buffalo B5 .....6.30  
Camden, N.J. P13 .....6.35  
Carnegie, Pa. C12 .....5.90  
Chicago W18 .....6.25  
Cleveland A7, C20 .....5.90  
Detroit R7 .....5.90  
Detroit B5 .....6.45  
Detroit P17 .....6.10  
Donora, Pa. A7 .....5.90  
Elyria, O. W18 .....5.90  
Franklin Park, Ill. N5 .....5.90  
Gary, Ind. R2 .....5.90  
Green Bay, Wis. F7 .....5.90  
Hammond, Ind. L2, M13 .....5.90  
Hartford, Conn. R2 .....6.75  
Harvey, Ill. B5 .....6.25  
Los Angeles S30 .....7.35  
Los Angeles R2 .....7.70  
Massillon, Mass. B5 .....6.80  
Massillon, O. R2, R8 .....5.90  
Midland, Pa. C18 .....5.90  
Monaca, Pa. S17 .....5.90  
Newark, N.J. W18 .....6.70  
New Castle, Pa. (17) B4 .....5.90  
Pittsburgh J5 .....5.90  
Plymouth, Mich. P5 .....6.15  
Putnam, Conn. W18 .....6.80  
Readville, Mass. C14 .....6.45  
S. Chicago, Ill. W14 .....5.90  
Spring City, Pa. K3 .....6.35  
Struthers, O. Y1 .....5.90  
Waukegan, Ill. A7 .....5.90  
Worcester, Mass. W19 .....6.35  
Youngstown F3, Y1 .....5.90

\*Including 0.35c for special quality.

### BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland, Md. (5) C19 .....\$5.16  
BARS, Cold-Finished Alloy  
Ambridge, Pa. W18 .....\$7.425  
Beaver Falls, Pa. M12, R2 .....7.425  
Bethlehem, Pa. B2 .....7.425  
Buffalo B5 .....7.425  
Camden, N.J. P13 .....7.60  
Canton, O. T7 .....7.425  
Carnegie, Pa. C12 .....7.425  
Chicago W18 .....7.425  
Cleveland A7, C20 .....7.425  
Detroit R7 .....7.425  
Detroit B5, P17 .....7.625  
Donora, Pa. A7 .....7.425  
Elyria, O. W8 .....7.425  
Gary, Ind. B2 .....7.425  
Green Bay, Wis. F7 .....7.425  
Hammond, Ind. L2, M13 .....7.425  
Hartford, Conn. R2 .....7.725  
Harvey, Ill. B5 .....7.425  
Lackawanna, N.Y. B2 .....7.425  
Los Angeles S30 .....9.10  
Massillon, Mass. B5 .....7.725  
Massillon, O. R2, R8 .....7.425  
Midland, Pa. C18 .....7.425  
Monaca, Pa. S17 .....7.425  
Newark, N.J. W18 .....7.60  
Plymouth, Mich. P5 .....7.625  
S. Chicago W14 .....7.425  
Spring City, Pa. K3 .....7.60  
Struthers, O. Y1 .....7.425  
Warren, O. C17 .....7.425  
Waukegan, Ill. A7 .....7.425  
Worcester, Mass. A7 .....7.725  
Youngstown F3, Y1 .....7.425

### BARS, Reinforcing (To Fabricators)

Ala. City, Ala. R2 .....\$4.65  
Atlanta A11 .....4.85  
Birmingham C15 .....5.15  
Buffalo R2 .....4.65  
Cleveland R2 .....4.65  
Ecorse, Mich. G5 .....4.75  
Emeryville, Calif. J7 .....5.40  
Fairfield, Ala. T2 .....4.65  
Fairless Hills, Pa. U5 .....4.80  
Fontana, Calif. K1 .....5.35  
Joliet, Ill. P22 .....5.10  
Niles, Calif. P1 .....5.35  
Pittsburgh J5 .....4.65



Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 .....4.65
Joliet, Ill. P22 .....5.15
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 .....4.65
LosAngeles B3 .....5.35
Milwaukee,Pa. M18 .....4.65
Minneapolis,Colo. C10 .....5.10
Niles,Calif. P1 .....5.55
Pittsburgh,Calif. C11 .....4.65
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SandSprings,Okla. S5 .....5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 .....4.65
S.SanFrancisco B3 .....5.40
SparrowsPoint,Md. B2 .....4.65
Sterling, Ill. (1) N15 .....4.65
Sterling, Ill. N15 .....4.75
Struthers, O. Y1 .....4.65
Torrance, Calif. C11 .....5.35
Youngstown R2, U5, Y1.4.65

## BARS, Reinforcing

(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2.6.15
KansasCity,Kans. S5 .....6.45
Lackawanna,N.Y. B2 .....6.17
Marion, O. P11 .....6.15
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ¼-1" B2.6.15
Williamsport,Pa. S19 .....6.00

## RAIL STEEL BARS

ChicagoHts. (3) C2, I-2.4.65
ChicagoHts. (4) C2, I-2.4.65
El Worth, Tex. (26) T4 .....5.10
Franklin, Pa. (3) F5 .....4.65
Franklin, Pa. (4) F5 .....4.65
JerseyShore, Pa. (4) J8 .....4.60
Marion, O. (3) P11 .....4.65
Moline, Ill. (3) R2 .....4.65
Tonawanda (3) B12 .....4.65
Tonawanda (4) B12 .....5.15
Williamsport, Pa. (3) S19 .....4.65

## BARS, Wrought Iron

Economy, Pa. (S.R.) B14 11.50
Economy, Pa. (D.R.) B14 14.30
Economy (Staybolt) B14 14.65
McK Rks. (S.R.) L5 .....11.50
McK Rks. (D.R.) L5 .....16.00
McK Rks. (Staybolt) L5.17.00

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A3 Allegheny Ludlum Steel
A4 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A5 American Shim Steel Co.
A6 American Steel & Wire Div., U. S. Steel Corp.
A7 Anchor Drawn Steel Co.
A8 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Braeburn Alloy Steel
B8 Bralnard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Steel Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperwell Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

## SHEETS

### SHEETS, Hot-Rolled Steel

(18 Gage and Heavier)

Ala. City, Ala. R2 .....4.325
Allenport, Pa. P7 .....4.325
Ashland, Ky. (8) A10 .....4.325
Cleveland J5, R2 .....4.325
Conshohocken, Pa. A3 .....4.375
Detroit (8) M1 .....4.425
Dravosburg, Pa. U5 .....4.325
Ecorse, Mich. G5 .....4.425
Fairfield, Ala. T2 .....4.325
FairlessHills, Pa. U5 .....4.375
Fontana, Calif. K1 .....5.075
Gary, Ind. U5 .....4.325
Geneva, Utah C11 .....4.425
GraniteCity, Ill. G4 .....4.525
Ind. Harbor, Ind. I-2, Y1 4.325
Lackawanna, N.Y. B2 .....4.325
Mansfield, O. E6 (37) .....4.325
Munhall, Pa. U5 .....4.325
Newport, Ky. (8) N9 .....4.325
Niles, O. M21 .....4.325
Pittsburgh, Calif. C11 .....5.025
Pittsburgh J5 .....4.325
Portsmouth, O. P12 .....4.325
Riverdale, Ill. A1 .....4.55
Sharon, Pa. S3 .....4.325
S.Chicago, Ill. W14 .....4.325
SparrowsPoint, Md. B2 .....4.325
Steubenville, O. W10 .....4.325
Warren, O. R2 .....4.325
Weirton, W. Va. W6 .....4.325
Youngstown U5, Y1 .....4.325

### SHEETS, H.R. (19 Ga. & Lighter)

Ala. City, Ala. R2 .....5.625
Niles, O. M21 .....5.325

### SHEETS, H.R. Alloy

Ind. Harbor, Ind. Y1 .....7.20

### SHEETS, H.R. (14 Ga. & Heavier)

High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken, Pa. A3 .....6.425
Dravosburg, Pa. U5 .....6.375
Ecorse, Mich. G5 .....6.475
Fairfield, Ala. T2 .....6.375
FairlessHills, Pa. U5 .....6.425
Fontana, Calif. K1 .....7.125

Gary, Ind. U5 .....6.375
Ind. Harbor, Ind. I-2, Y1 6.375
Lackawanna (35) B2 .....6.375
Munhall, Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon, Pa. S3 .....6.375
S.Chicago, Ill. U5 .....6.375
SparrowsPoint (36) B2 .....6.375
Warren, O. R2 .....6.375
Weirton, W. Va. W6 .....6.375
Youngstown U5, Y1 .....6.375

### SHEETS, Hot-Rolled Ingot Iron

(18 Gage and Heavier)

Ashland, Ky. (8) A10 .....4.575
Ind. Harbor, Ind. I-2 .....4.575

### SHEETS, Cold-Rolled Steel

(Commercial Quality)

Allenport, Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken, Pa. A3 .....5.375
Dravosburg, Pa. U5 .....5.325
Detroit M1 .....5.325
Ecorse, Mich. G5 .....5.425
Fairfield, Ala. T2 .....5.325
FairlessHills, Pa. U5 .....5.375
Follansbee, W. Va. F4 .....5.325
Fontana, Calif. K1 .....6.425
Gary, Ind. U5 .....5.325
GraniteCity, Ill. G4 .....5.525
Ind. Harbor, Ind. I-2, Y1 5.325
Lackawanna, N.Y. B2 .....5.325
Mansfield, O. E6 .....5.325
Middletown, O. A10 .....5.325
Newport, Ky. N9 .....5.325
Pittsburgh, Calif. C11 .....6.275
Pittsburgh J5 .....5.325
Portsmouth, O. P12 .....5.325
SparrowsPoint, Md. B2 .....5.325
Steubenville, O. W10 .....5.325
Warren, O. R2 .....5.325
Weirton, W. Va. W6 .....5.325
Youngstown Y1 .....5.325

### SHEETS, Cold-Rolled

High-Strength Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg, Pa. U5 .....7.875
Ecorse, Mich. G5 .....7.975
FairlessHills, Pa. U5 .....7.925
Fontana, Calif. K1 .....8.975
Gary, Ind. U5 .....7.875
Indiana Harbor, Ind. Y1 7.875
Lackawanna (37) B2 .....7.875
Pittsburgh J5 .....7.875

SparrowsPoint (38) B2 .....7.875
Warren, O. R2 .....7.875
Weirton, W. Va. W6 .....7.875
Youngstown Y1 .....7.875

### SHEETS, Cold-Rolled Ingot Iron

Middletown, O. A10 .....5.825

### SHEETS, Culver

(16 Gage)

Ashland, Ky. A10 .....6.90
Canton, O. R2 .....6.10
Dravosburg U5 .....6.10
Fairfield T2 .....6.10
Gary, Ind. U5 .....6.10
Ind. Harbor I-2 .....6.10
Kokomo, Ind. C16 .....6.20
MartinsFry. W10 .....6.10
Newport, Ky. N9 .....6.10
Pitts., Calif. C11 .....6.85
SparrowsPt. B2 .....6.10

### SHEETS, Culvert—Pure Iron

Ashland, Ky. A10 .....7.15
Gary, Ind. U5 .....6.35
MartinsFry. O. W10 .....6.35

### SHEETS, Galvanized Steel

Hot-Dipped

Ala. City, Ala. R2 .....5.85†
Ashland, Ky. A10 .....5.85†
Canton, O. R2 .....5.85†
Dover, O. R1 .....5.85†
Dravosburg, Pa. U5 .....5.85†
Fairfield, Ala. T2 .....5.85†
Gary, Ind. U5 .....5.85*
GraniteCity, Ill. G4 .....6.05
Ind. Harbor, Ind. I-2 .....5.85†
Kokomo, Ind. C16 .....5.95†
MartinsFerry, O. W10 .....5.85*
Middletown, O. A10 .....5.85†
Newport, Ky. N9 .....5.85†
Pittsburgh, Calif. C11 .....6.80*
SparrowsPt., Md. B2 .....5.85†
Warren, O. R2 .....5.85†
Weirton, W. Va. W6 .....5.85*

\*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

### SHEETS, Well Casing

Fontana, Calif. K1 .....6.575

### SHEETS, Galvanized

High-Strength Low-Alloy

Dravosburg, Pa. U5 .....8.60
SparrowsPoint (39) B2 .....8.60

### SHEETS, Galvannealed Steel

Canton, O. R2 .....6.25
Dravosburg, Pa. U5 .....6.25
Kokomo, Ind. C16 .....6.60
Newport, Ky. N9 .....6.25

### SHEETS, Galvanized Ingot Iron

(Hot-dipped Continuous)

Ashland, Ky. A10 .....6.10
Middletown, O. A10 .....6.10

### SHEETS, Electrogalvanized

Cleveland (28) R2 .....6.70
Niles, O. (28) R2 .....6.70
Weirton, W. Va. W6 .....6.55

### SHEETS, Aluminum Coated

Butler, Pa. A10 (type 1) 8.50
Butler, Pa. A10 (type 2) 8.60

### SHEETS, Enameling Iron

Ashland, Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg, Pa. U5 .....5.90
Gary, Ind. U5 .....5.90
GraniteCity, Ill. G4 .....6.10
Ind. Harbor, Ind. I-2 .....5.90
Middletown, O. A10 .....5.90
Niles, O. M21 .....5.90
Youngstown Y1 .....5.90

### BLUED STOCK, 29 Gage

Follansbee, W. Va. F4 .....7.75
Ind. Harbor, Ind. I-2 .....7.75
Yorkville, O. W10 .....7.75

### SHEETS, Long Terme Steel

(Commercial Quality)

BeechBottom, W. Va. W10 6.25
Gary, Ind. U5 .....6.25
Mansfield, O. E6 .....6.25
Middletown, O. A10 .....6.25
Niles, O. M21 .....6.25
Weirton, W. Va. W6 .....6.25

### SHEETS, Long Terme, Ingot Iron

Middletown, O. A10 .....6.65

## —Key to Producers—

A1 Acme Steel Co.	C22 Claymont Steel Products	J4 Jessop Steel Co.	O3 Oliver Iron & Steel Corp.	S20 Southern States Steel
A2 Alan Wood Steel Co.	Dept. Wickwire Spencer	J4 Johnson Steel & Wire Co.	O4 Oregon Steel Mills	S23 Superior Tube Co.
A3 Allegheny Ludlum Steel	Steel Division	J5 Jones & Laughlin Steel		S25 Stainless Welded Prod.
A4 Alloy Metal Wire Div., H. K. Porter Co. Inc.	C23 Charter Wire Inc.	J6 Joslyn Mfg. & Supply	P1 Pacific States Steel Corp.	S26 Specialty Wire Co. Inc.
A5 American Shim Steel Co.	C24 G. O. Carlson Inc.	J7 Judson Steel Corp.	P2 Pacific Tube Co.	S30 Sierra Drawn Steel Corp.
A6 American Steel & Wire Div., U. S. Steel Corp.		J8 Jersey Shore Steel Co.	P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.	S40 Seneca Steel Service
A7 Anchor Drawn Steel Co.	D2 Detroit Steel Corp.	K1 Kaiser Steel Corp.	P5 Pilgrim Drawn Steel	T2 Tenn. Coal & Iron Div. U. S. Steel Corp.
A8 Angell Nail & Chaplet	D3 Detroit Tube & Steel Div., Sharon Steel Corp.	K2 Keokuk Electro-Metals	P6 Pittsburgh Coke & Chem.	T3 Tenn. Prod. & Chem.
A10 Armco Steel Corp.	D4 Disston & Sons, Henry	K3 Keystone Drawn Steel	P7 Pittsburgh Steel Co.	T4 Texas Steel
A11 Atlantic Steel Co.	D6 Driver-Harris Co.	K4 Keystone Steel & Wire	P11 Pollak Steel Co.	T5 Thomas Strip Division, Pittsburgh Steel Co.
	D7 Dickson Weatherproof Nail Co.	K7 Kenmore Metals Corp.	P12 Portsmouth Division Detroit Steel Corp.	T6 Thompson Wire Co.
B1 Babcock & Wilcox Co.	D8 Damascus Tube Co.	L1 Laclede Steel Co.	P13 Precision Drawn Steel	T7 Timken Roller Bearing
B2 Bethlehem Steel Co.	D9 Wilbur B. Driver Co.	L2 LaSalle Steel Co.	P14 Pitts. Screw & Bolt Co.	T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
B3 Beth. Pac. Coast Steel	E1 Eastern Gas & Fuel Assoc.	L3 Labrobe Steel Co.	P15 Pittsburgh Metallurgical	T13 Tube Methods Inc.
B4 Blair Strip Steel Co.	E2 Eastern Stainless Steel	L6 Lockhart Iron & Steel	P16 Page Steel & Wire Div., Amer. Chain & Cable	U4 Universal Cyclops Steel
B5 Bliss & Laughlin Inc.	E4 Electro Metallurgical Co.	L7 Lone Star Steel Co.	P17 Plymouth Steel Co.	U5 United States Steel Corp.
B6 Braeburn Alloy Steel	E5 Elliott Bros. Steel Co.	M1 McLouth Steel Corp.	P19 Pitts. Rolling Mills	U6 U. S. Pipe & Foundry
B8 Bralnard Steel Div., Sharon Steel Corp.	E6 Empire Steel Corp.	M4 Mahoning Valley Steel	P20 Prod. Steel Strip Corp.	U7 Ulbrich Stainless Steels
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron	F2 Fifth Sterling Inc.	M6 Mercer Pipe Div., Sawhill Tubular Products	P22 Phoenix Mfg. Co.	U8 U. S. Steel Supply Div. U. S. Steel Corp.
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Steel Corp.	F3 Fitzsimmons Steel Co.	M8 Mid-States Steel & Wire	R1 Reeves Steel & Mfg. Co.	V2 Vanadium-Alloys Steel
B12 Buffalo Steel Corp.	F4 Follansbee Steel Corp.	M12 Moltrop Steel Products	R2 Republic Steel Corp.	V3 Vulcan Crucible Division, H. K. Porter Co. Inc.
B14 A. M. Byers Co.	F5 Franklin Steel Div. Borg-Warner Corp.	M13 Monarch Steel Div., Jones & Laughlin Steel Corp.	R3 Rhode Island Steel Corp.	
B15 J. Bishop & Co.	F6 Free-Moon Tube Co.	M14 McInnes Steel Co.	R5 Roebeling's Sons, John A.	
	F7 Ft. Howard Steel & Wire	M16 Md. Fine & Special. Wire	R6 Rome Strip Steel Co.	
	F8 Ft. Wayne Metals Inc.	M17 Metal Forming Corp.	R7 Rotary Electric Steel Co.	
C1 Calstrip Steel Corp.	G2 Globe Iron Co.	M18 Milton Steel Prod. Div., Merritt-Chapman & Scott	R8 Reliance Div., Eaton Mfg. Corp.	
C2 Calumet Steel Div., Borg-Warner Corp.	G3 Granite City Steel Co.	M21 Malloy-Sharon Titanium Corp.	R9 Rome Mfg. Co.	
C4 Carpenter Steel Co.	G4 Great Lakes Steel Corp.	N1 National-Standard Co.	R10 Rodney Metals Inc.	
C7 Cleve. Cold Rolling Mills	G5 Greer Steel Co.	N2 National Supply Co.	S1 Seneca Wire & Mfg. Co.	
C8 Cold Metal Products Co.	H1 Hanna Furnace Corp.	N3 National Tube Div., U. S. Steel Corp.	S3 Sharon Steel Corp.	
C9 Colonial Steel	H7 Helical Tube Co.	N5 Nelson Steel & Wire Co.	S4 Sharon Tube Co.	
C10 Colorado Fuel & Iron	I-1 Ingot Steel Corp.	N6 NewEng. HighCarb. Wire	S5 Sheffield Steel Div., Armco Steel Corp.	
C11 Columbia-Geneva Steel	I-2 Inland Steel Co.	N8 Newman-Crosby Steel	S6 Shenango Furnace Co.	
C12 Columbia Steel & Shaft.	I-3 Interlake Iron Corp.	N9 Newport Steel Corp.	S7 Simmons Co.	
C13 Columbia Tool Steel Co.	I-4 Ingersoll Steel Div., Borg-Warner Corp.	N14 Northwest SteelRoll.Mills	S8 Simonds Saw & Steel Co.	
C14 Compressed Steel Shaft.	I-6 Ivins, E., Steel Tube	N15 Northwestern S.&W. Co.	S12 Spencer Wire Corp.	
C15 Connors Steel Div., H. K. Porter Co. Inc.	I-7 Indiana Steel & Wire Co.	N16 New Delphos Mfg. Co.	S13 Standard Forgings Corp.	
C16 Continental Steel Corp.	J1 Jackson Iron & Steel Co.	N19 Northeastern Steel Corp.	S14 Standard Tube Co.	
C17 Copperwell Steel Co.			S15 Stanley Works	
C18 Crucible Steel Co.			S17 Superior Drawn Steel Co.	
C19 Cumberland Steel Co.			S18 Superior Steel Corp.	
C20 Cuyahoga Steel & Wire			S19 Sweet's Steel Co.	
				Y1 Youngstown Sheet & Tube



## STRIP

### STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.325
Allentown, Pa. P7	4.325
Alton, Ill. L1	4.325
Ashland, Ky. (8) A10	4.325
Atlanta A11	4.325
Bessemer, Ala. T2	4.325
Birmingham C15	4.825
Bridgeport, Conn. N19	4.625
Buffalo (27) R2	4.325
Conshohocken, Pa. A3	4.375
Detroit M1	4.425
Ecorse, Mich. G5	4.425
Fairfield, Ala. T2	4.325
Fontana, Calif. K1	5.075
Gary, Ind. U5	4.325
Ind. Harbor, Ind. I-2, Y1	4.325
Johnstown, Pa. (25) B2	4.325
Lackawanna, N.Y. (24) B2	4.325
Los Angeles (25) B3	5.075
Milton, Pa. M18	4.325
Minneapolis, Colo. C10	5.425
New Britain (10) S15	4.325
Pittsburgh, Calif. C11	5.075
Portsmouth, O. P12	4.325
Riverdale, Ill. A1	4.55
San Francisco S7	5.05
Seattle (25) B3	5.325
Sharon, Pa. S3	4.325
S. Chicago, Ill. W14	4.325
S. San Francisco (25) B3	5.075
SparrowsPoint, Md. B2	4.325
Sterling (1) N15	4.325
Sterling, Ill. N15	4.425
Torrance, Calif. C11	5.075
Warren, O. R2	4.325
Weirton, W. Va. W6	4.325
Youngstown U5	4.325

### STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.50
Carnegie, Pa. S18	7.20
Fontana, Calif. K1	8.85
Gary, Ind. U5	7.20
Ind. Harbor, Ind. Y1	7.20
Los Angeles B3	8.40
Newport, Ky. N9	7.20
Sharon, Pa. S3	7.20
S. Chicago W14	7.20
Youngstown U5	7.20

### STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer, Ala. T2	6.425
Conshohocken, Pa. A3	6.425
Ecorse, Mich. G5	6.525
Fairfield, Ala. T2	6.425
Fontana, Calif. K1	7.525
Gary, Ind. U5	6.425
Houston S5	6.675
Ind. Harbor, Ind. I-2, Y1	6.425
Kansas City, Mo. S5	6.675
Lackawanna, N.Y. B2	6.425
Los Angeles (25) B3	7.175
Seattle (25) B3	7.425
Sharon, Pa. S3	6.425
S. San Francisco (25) B3	7.175
SparrowsPoint, Md. B2	6.425
Warren, O. R2	6.425
Weirton, W. Va. W6	6.425
Youngstown U5	6.425

### STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.575
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### STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken, Pa. A3	6.30
Dearborn, Mich. D3	6.30
Detroit D2, M1, P20	6.35
Dover, O. G6	6.25
Ecorse, Mich. G5	6.35
Follansbee, W. Va. F4	6.25
Fontana, Calif. K1	8.00
Franklin Park, Ill. T6	6.35
Ind. Harbor, Ind. I-2	6.35
Ind. Harbor, Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna, N.Y. B2	6.25
Los Angeles C1	8.30
New Bedford, Mass. R10	6.70
New Britain (10) S15	6.25
New Castle, Pa. B4	6.25
New Haven, Conn. A7, D2	6.70
New Kensington, Pa. A6	6.25
Pawtucket, R.I. R3	6.90
Pawtucket, R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale, Ill. A1	6.35
Rome, N.Y. (32) R6	6.25
Sharon, Pa. S3	6.25

SparrowsPt., Md. B2	6.25
Trenton, N.J. (31) R5	7.50
Wallingford, Conn. W2	6.70
Warren, O. R2, T5	6.25
Weirton, W. Va. W6	6.25
Worcester, Mass. A7	6.80
Youngstown C8, Y1	6.25

### STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie, Pa. S18	13.45
Cleveland A7	13.45
Dover, O. G6	13.45
Franklin Park, Ill. T6	13.45
Harrison, N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket, R.I. N8	13.80
Sharon, Pa. S3	13.45
Worcester, Mass. A7	13.75
Youngstown C8	13.45

### STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn, Mich. D3	9.20
Dover, O. G6	9.30
Ecorse, Mich. G5	9.20
Ind. Harbor, Ind. Y1	9.30

### STRIP, Cold-Finished

Spring Steel (Annealed)	0.40C	0.60C	0.80C	1.05C	1.35C
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol, Conn. W1	9.05	10.60	12.75	15.45	18.15
Carnegie, Pa. S18	7.10	9.05	10.60	12.75	15.45
Cleveland C7	8.95	10.50	12.65	15.35	18.05
Dearborn, Mich. D3	7.20	9.15	10.70	12.85	15.45
Detroit D2	7.20	9.15	10.70	12.85	15.45
Dover, O. G6	7.10	9.05	10.60	12.75	15.45
Follansbee, W. Va. F4	7.00	9.05	10.50**	12.65	15.35
Franklin Park, Ill. T6	7.10	9.05	10.50	12.65	15.35
Harrison, N.J. C18	7.25	9.20	10.60	12.75	15.45
Indianapolis C8	7.10	9.05	10.60	12.75	15.45
New Britain, Conn. (10) S15	7.10	9.05	10.60	12.75	15.45
New Castle, Pa. B4, E5	7.10	9.05	10.60	12.75	15.45
New Haven, Conn. D2	7.55	9.35	10.90	13.05	15.75
New Kensington, Pa. A6	7.10	9.05	10.60	12.75	15.45
New York W3	9.25	10.80	12.95	15.65	18.35
Pawtucket, R.I. N8	7.55	9.25	10.80	12.95	15.65
Riverdale, Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome, N.Y. (32) R6	7.00	9.05	10.50	12.65	15.35
Sharon, Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton, N.J. R5	9.35	10.90	13.05	15.75	18.45
Wallingford, Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren, O. T5	7.00	9.05	10.50	12.65	15.35
Weirton, W. Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester, Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester, Mass. A7	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45

\*\*0.65 C, max.

### Spring Steel (Tempered)

Bristol, Conn. W1	14.40	17.60
Buffalo W12	14.40	17.60
Franklin Park, Ill. T6	14.90	18.10
Harrison, N.J. C18	14.40	17.60
New York W3	14.40	17.60
Trenton, N.J. R5	14.40	17.60
Worcester, Mass. W12	14.40	17.60
Worcester, Mass. A7, T6	14.40	17.60
Youngstown C8	15.00	18.35

## SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma- ture	Elec- tric	Motor	Dyna- mo
BeechBottom, W. Va. W10	8.40	9.35	9.95	10.95	11.85
Brackenridge, Pa. A4	8.40	9.35	9.95	10.95	11.85
Mansfield, O. E6	8.40	9.35	9.95	10.95	11.85
Newport, Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles, O. M21	8.40	9.35	9.95	10.95	11.85
Vandergrift, Pa. U5	8.40	9.35	9.95	10.95	11.85
Warren, O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville, O. A10	8.40	9.35	9.95	10.95	11.85

### C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed 1/2c lower)	Field	Arma- ture	Elec- tric	Motor	Dyna- mo
Brackenridge, Pa. A4	8.80*	9.80*	10.40*	11.40*	12.60*
Granite City, Ill. G4	8.80*	9.80*	10.40*	11.40*	12.60*
Indiana Harbor, Ind. I-2	8.80*	9.80*	10.40*	11.40*	12.60*
Vandergrift, Pa. U5	8.80*	9.80*	10.40*	11.40*	12.60*
Vandergrift, Pa. U5	8.80*	9.80*	10.40*	11.40*	12.60*
Warren, O. R2	8.80*	9.80*	10.40*	11.40*	12.60*

### H.R. SHEETS (22 Ga., cut lengths)

BeechBottom, W. Va. W10	12.80	13.35	13.85	14.85
Brackenridge, Pa. A4	12.80	13.35	13.85	14.85
Newport, Ky. N9	12.80	13.35	13.85	14.85
Vandergrift, Pa. U5	12.80	13.35	13.85	14.85
Zanesville, O. A10	12.80	13.35	13.85	14.85

### C.R. COILS & CUT LENGTHS (22 Ga.)

Brackenridge, Pa. A4	15.85	17.45	17.95	18.55
Butler, Pa. A10	15.85	17.45	17.95	18.55
Vandergrift, Pa. U5	14.85	15.85	17.45	17.95
Warren, O. R2	14.85	15.85	17.45	17.95

\*Semiprocessed. \*Fully processed only. \*Coils, annealed, semiprocessed 1/2c lower. \$Coils, %cent higher.

## TIN MILL PRODUCTS

### TIN PLATE Electrolytic (Base Box)

Albuquerque, Pa. J5	7.90	8.15	8.55
Dravosburg, Pa. U5	7.90	8.15	8.55
Fairfield, Ala. T2	8.00	8.25	8.65
Fairless Hills, Pa. U5	8.00	8.25	8.65
Gary, Ind. U5	7.90	8.15	8.55
Granite City, Ill. G4	8.00	8.25	8.65
Indiana Harbor, Ind. I-2, Y1	7.90	8.15	8.55
Niles, O. R2	7.90	8.15	8.55
Pittsburgh, Calif. C11	8.65	8.90	9.30
SparrowsPoint, Md. B2	8.00	8.25	8.65
Weirton, W. Va. W6	7.90	8.15	8.55
Yorkville, O. W10	7.90	8.15	8.55

### ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Albuquerque, Pa. J5	6.675	6.875	7.075
Niles, O. R2	6.675	6.875	7.075

### TINPLATE, American 1.25 lb

Albuquerque, Pa. J5	\$9.20	\$9.45
Dravosburg, Pa. U5	9.20	9.45
Fairfield, Ala. T2	9.30	9.55
Fairless Hills, Pa. U5	9.30	9.55
Gary, Ind. U5	9.20	9.45
Ind. Har. I-2, Y1	9.20	9.45
Pitts., Calif. C11	9.95	10.20
Sp. Pt., Md. B2	9.30	9.55
Weirton, W. Va. W6	9.20	9.45
Yorkville, O. W10	9.20	9.45

### HOLLOWWARE ENAMELING

Black Plate (29 Gage)	
Dravosburg, Pa. U5	6.65
Gary, Ind. U5	6.65
Granite City, Ill. G4	6.75
Ind. Harbor, Ind. Y1	6.65
Yorkville, O. W10	6.65

### BLACK PLATE (Base Box)

Albuquerque, Pa. J5	\$7.00
Dravosburg, Pa. U5	7.00
Fairfield, Ala. T2	7.10
Fairless Hills, Pa. U5	7.10
Gary, Ind. U5	7.00
Granite City, Ill. G4	7.10
Ind. Harbor, Ind. I-2, Y1	7.00
Niles, O. R2	7.00
Pittsburgh, Calif. C11	7.75

### MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg, Pa. U5	\$8.70
Gary, Ind. U5	8.70
Yorkville, O. W10	8.70

### MANUFACTURING TERNES (Light Coated; 6 lb; Base Box)

Yorkville, O. W10	\$9.15
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### ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary, Ind. U5	\$10.25
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## WIRE

### WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. R2	6.60
Albuquerque, Pa. J5	6.25
Alton, Ill. L1	6.425
Atlanta A11	6.45
Bartonsville, Ill. K4	6.35
Buffalo W12	6.60
Chicago W13	6.25
Cleveland A7	6.60
Crawfordsville, Ind. M8	6.35
Donora, Pa. A7	6.60
Duluth, Minn. A7	6.60
Fairfield, Ala. T2	6.60
Fostoria, O. (24) S1	6.45
Houston S5	6.50
Jacksonville, Fla. M8	6.77
Johnstown, Pa. B2	6.25
Joliet, Ill. A7	6.60
Kansas City, Mo. S5	6.50
Kokomo, Ind. C16	6.35
Los Angeles B3	7.20
Minneapolis, Colo. C10	6.50
Monessen, Pa. P7	6.25
Newark 6-8 g. I-1	6.90
N. Tonawanda B11	6.25
Palmer, Mass. W12	6.90
Pittsburgh, Calif. C11	7.20
Portsmouth, O. P12	6.25
Rankin, Pa. A7	6.60
S. Chicago, Ill. R2	6.60
S. San Francisco C10	7.20
SparrowsPoint, Md. B2	6.35
Sterling, Ill. N15	6.25
Struthers, O. Y1	6.25
Waukegan, Ill. A7	6.60
Worcester, Mass. A7	6.90

### WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	12.725
Bartonsville, Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.65
Crawfordsville, Ind. M8	12.55
Fostoria, O. S1	12.55
Jacksonville, Fla. M8	13.08
Johnstown, Pa. B2	12.55
Kokomo, Ind. C16	12.55
Minneapolis, Colo. C10	12.30
Monessen, Pa. P6	12.55
Muncie, Ind. I-7	12.75
Palmer, Mass. W12	12.85
Roebeling, N.J. R5	12.85
S. San Francisco C10	12.90
Waukegan, Ill. A7	12.55
Worcester, Mass. A7, T6	12.85

### WIRE, MB Spring, High Carbon

Albuquerque, Pa. J5	7.90
Alton, Ill. L1	8.075
Bartonsville, Ill. K4	8.00
Buffalo W12	7.90



## WIRE

(Continued)

### WIRE, Tire Bead

Bartonville, Ill. K4	14.15
Monessen, Pa. P16	14.20
Roebeling, N.J. R5	14.35

### WIRE, Cold-Rolled Flat

Anderson, Ind. G6	9.00
Baltimore T6	9.30
Buffalo W12	9.00
Cleveland A7	9.00
Crawfordsville, Ind. M8	9.00
Dover, O. G6	9.00
Fostoria, O. S1	9.00
Franklin Park, Ill. T6	9.10
Kokomo, Ind. C16	9.00
Massillon, O. R8	9.00
Milwaukee C23	9.20
Monessen, Pa. P16	9.00
Pawtucket, R.I. N8	9.30
Riverdale, Ill. A1	9.10
Rome, N.Y. R6	9.00
Trenton, N.J. R5	9.00
Worcester A7, T6, W12	9.30

### NAIL, Stock

To Dealers & Mfrs. (7) Col.

Alabama City, Ala. R2	152
Alliquippa, Pa. J5	152
Atlanta A11	154
Bartonville, Ill. K4	154
Chicago, Ill. W13	152
Cleveland A9	157
Crawfordsville, Ind. M8	154
Donora, Pa. A7	152
Duluth, Minn. A7	152
Fairfield, Ala. T2	152
Galveston, Tex. D7	157
Houston, Tex. S5	157
Johnstown, Pa. B2	152
Joliet, Ill. A7	152
Kansas City, Mo. S5	157
Kokomo, Ind. C16	154
Minnequa, Colo. C10	157
Monessen, Pa. P7	152
Pittsburg, Calif. C11	171
Rankin, Pa. A7	152
S. Chicago, Ill. R2	152
Sparrows Pt., Md. B2	154
Sterling, Ill. (1) N15	152
Worcester, Mass. A7	158

### NAIS, CUT (100 lb keg)

To Dealers (33)

Conshohocken, Pa. A3	\$9.05
Wheeling, W. Va. W10	\$9.05

### STAPLES, Polished Stock

To Dealers & Mfrs. (7) Col.

Alliquippa, Pa. J5	152
Atlanta A11	154
Bartonville, Ill. K4	154
Crawfordsville, Ind. M8	154
Donora, Pa. A7	152
Duluth, Minn. A7	152
Fairfield, Ala. T2	152
Johnstown, Pa. B2	152
Joliet, Ill. A7	152
Kokomo, Ind. C16	154
Minnequa, Colo. C10	157
Monessen, Pa. P7	152
Pittsburg, Calif. C11	171
Rankin, Pa. A7	152
Sparrows Pt., Md. B2	154
Sterling, Ill. (1) N15	152
Worcester, Mass. A7	158

### TIE WIRE, Automatic Baler

(14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150

Alabama City, Ala. R2	\$9.35
Bartonville, Ill. K4	9.45
Buffalo W12	9.35
Crawfordsville, Ind. M8	9.46
Donora, Pa. A7	9.35
Duluth, Minn. A7	9.35
Johnstown, Pa. B2	9.35
Joliet, Ill. A7	9.35
Kokomo, Ind. C16	9.35
Los Angeles B3	10.14
Minnequa, Colo. C10	9.60
Pittsburg, Calif. C11	10.13
S. Chicago, Ill. R2	9.35
Sparrows Pt., Md. B2	9.45
Sterling, Ill. N15	9.35

Coil No. 6500 Stand.

Alabama City, Ala. R2	\$9.65
Bartonville, Ill. K4	9.75
Buffalo W12	9.65
Crawfordsville, Ind. M8	9.75
Donora, Pa. A7	9.65
Duluth, Minn. A7	9.65
Johnstown, Pa. B3	9.65
Joliet, Ill. A7	9.65
Kokomo, Ind. C16	9.75
Los Angeles B3	10.45
Minnequa, Colo. C10	9.90
Pittsburg, Calif. C11	10.45
S. Chicago, Ill. R2	9.65
Sparrows Pt., Md. B2	9.75
Sterling, Ill. N15	9.65

Coil No. 6500 Interim

Alabama City, Ala. R2	\$9.70
Bartonville, Ill. K4	9.80

Buffalo W12	9.70
Crawfordsville, Ind. M8	9.80
Donora, Pa. A7	9.70
Joliet, Minn. A7	9.70
Johnstown, Pa. B2	9.70
Joliet, Ill. A7	9.70
Kokomo, Ind. C16	9.80
Los Angeles B3	10.50
Minnequa, Colo. C10	9.95
Pittsburg, Calif. C11	10.50
S. Chicago, Ill. R2	9.70
Sparrows Pt., Md. B2	9.80
Sterling, Ill. N15	9.70

### WIRE, Barbed Col.

Alabama City, Ala. R2	175**
Alliquippa, Pa. J5	172*
Atlanta A11	181
Bartonville, Ill. K4	181
Crawfordsville, Ind. M8	181
Donora, Pa. A7	175*
Duluth, Minn. A7	175*
Fairfield, Ala. T2	175*
Houston, Tex. S5	180*
Johnstown, Pa. B2	179*
Joliet, Ill. A7	175*
Kansas City, Mo. S5	180*
Kokomo, Ind. C16	177*
Minnequa, Colo. C10	180**
Monessen, Pa. P7	178**
Pittsburg, Calif. C11	195*
Rankin, Pa. A7	175*
S. Chicago, Ill. R2	175**
S. San Francisco C10	195**
Sparrows Pt., Md. B2	181*
Sterling, Ill. (1) N15	179**

### WOVEN Fence, 9-15 ga. Col.

Ala. City, Ala. R2	162**
Ala. City, 17 ga. R2	257**
Ala. City, 18 ga. R2	267**
Alliquippa, Pa. 9-14½ ga J5	165*
Atlanta A11	168
Bartonville, Ill. K4	168
Crawfordsville, Ind. M8	168
Donora, Pa. A7	162*
Duluth, Minn. A7	162*
Fairfield, Ala. T2	162*
Houston, Tex. S5	167*
Johnstown, Pa. (43) B2	166
Joliet, Ill. A7	162*
Kansas City, Mo. S5	167*
Kokomo, Ind. C16	164*
Minnequa, Colo. C10	167**
Monessen, Pa. 9 ga. P7	167**
Pittsburg, Calif. C11	185*
Rankin, Pa. A7	162*
S. Chicago, Ill. R2	162**
Sterling, Ill. (1) N15	166**

### WIRE (16 Gage) Stone Stov.

Ala. City R2	14.50
Bartonville K4	16.05
Buffalo W12	14.50
Cleveland A7	14.50
Crawfordsville M8	14.60
Fostoria, O. S1	14.60
Johnstown B2	14.50
Kokomo C16	14.60
Minnequa C10	14.75
Palmer, Mass. W12	14.50
Pitts., Calif. C11	14.85
S. Chicago R2	14.50
Sparrows Pt. B2	14.50
Sterling (1) N15	14.50
Waukegan A7	14.50
Worcester A7	14.80

### WIRE, Merchant Quality

(6 to 8 gage) An'd Galv.

Ala. City, Ala. R2	7.40
Alliquippa J5	7.40
Atlanta A11	7.50
Bartonville (48) K4	7.50
Buffalo W12	7.40
Cleveland A7	7.40
Crawfordsville M8	7.50
Donora, Pa. A7	7.40
Duluth, Minn. A7	7.40
Fairfield T2	7.40
Houston, Tex. S5	7.65
Johns. Fla. M8	7.90
Johnstown B2 (48)	7.40
Joliet, Ill. A7	7.40
Kansas City, Mo. S5	7.65
Kokomo C16	7.50
Los Angeles B3	8.35
Minnequa C10	7.65
Monessen P7 (48)	7.40
Palmer, Mass. W12	7.70
Pitts., Calif. C11	8.35
Portsmouth, O. P12	7.40
Rankin A7	7.40
S. Chicago R2	7.40
S. San Fran. C10	8.35
Sparrows Pt. B2 (48)	7.50
Str'ng (1) (48) N15	7.40
Struthers, O. (48) Y1	7.40
Worcester, Mass. A7	7.70

\*Based on 12.50c zinc; †5c zinc; ‡10c zinc; §Less than 10c zinc; \*\*Subject to zinc

equalization extras. ††13c

equalization extras.

equalization extras.

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## BALE TIES, Single Loop Col.

Alabama City, Ala. R2	173
Atlanta A11	175
Bartonville, Ill. K4	175
Crawfordsville, Ind. M8	175
Donora, Pa. A7	173
Duluth, Minn. A7	173
Fairfield, Ala. T2	173
Joliet, Ill. A7	173
Houston S5	178
Kansas City, Mo. S5	178
Kokomo, Ind. C16	175
Minnequa, Colo. C10	178
S. Chicago R2	173
S. San Fran., Calif. C10	197
Sparrows Point, Md. B2	175
Sterling, Ill. (1) N15	173

## FENCE POSTS Col.

Chicago, Ill. C2, I-2	157
Duluth, Minn. A7	157
Franklin, Pa. F5	157
Huntington, W. Va. W7	157
Johnstown, Pa. B2	157
Marion, O. P11	157
Minnequa, Colo. C10	162
Moline, Ill. R2	162
S. Chicago, Ill. R2	157
Tonawanda, N.Y. B12	157
Williamsport, Pa. S10	160

## FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

### Carriage, Machine Bolts

Full-Size Body (cut thread)

1½" x 6" and smaller 61

Larger than 1½" diam. and all diams. longer than 6" 55

Under-Size Body (rolled thread; not nutted):

½" x 6" and smaller. 61

1½" x 4" and smaller and shorter are not nutted.

### Carriage, Machine & Lag Bolts, Hot Galvanized:

½" and smaller 42

Larger than ½" diam. and all diams. longer than 6" 32

### Lag Bolts

All diams. & 6" and shorter 61

All diams. longer than 6" 55

### Flow, Tap & Blank Bolts

½" x 6" and smaller. 61

Larger than ½" diam. and all diams. longer than 6" 55

### Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:

All sizes 61

### STOVE BOLTS, SLOTTED (nuts not attached; bulk)

¾" to 1½" diam. incl., 3" or shorter 61

25,000 to 99,999 pieces 61

200,000 or more pieces 64

¾" to 1½" diam. incl., 3" or shorter 61

15,000 to 99,999 pieces 61

100,000 or more pieces 64

Longer than 3", any diam.: 5000 to 99,999 pieces. 61

100,000 or more pieces 64

## RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburg, Pa. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.95

¾-in. under. List less 32%

## Footnotes

(1) Chicago Base.

(2) Angles, flats, bands.

(3) Merchant.

(4) Reinforcing.

(5) 1½-in. to less than 17/16-in.

(6) Chicago or Birm. base.

(7) To jobbers, 3 cols. lower.

(8) 16 Ga. and heavier.

(9) Merchant quality; add 0.35c for special quality.

(10) Pittsburgh base.

(11) Cleveland & Pitts. base.

(12) Worcester, Mass. base.

(13) Add 0.25c for 17 Ga. & heavier.

(14) Gage 0.143 to 0.249 in. for gage 0.142 and lighter, 5.80c.

(15) ½" and thinner.

(16) 40 lb and under.

## BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D.	B.W. Gage	H.R.	Seamless	Elec. Weld
1	13	21.06	20.42	
1½	13	24.94	20.45	
1½	13	23.31	27.57	22.61
1½	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2½	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.60
2½	12	41.57	49.16	40.31
2½	12	45.00	53.22	43.65
3	12	47.99	56.76	46.55

## RAILWAY MATERIALS

Standard Tee Rails

No. 1 No. 2 All 60 lb

Bessemer, Pa. U5 4.725 4.625 4.675 5.65

Ensley, Ala. T2 4.725 4.625 4.675 5.65

Fairfield, Ala. T2 4.725 4.625 4.675 5.65

Gary, Ind. U5 4.725 4.625 4.675 5.65

Huntington, W. Va. W7 4.725 4.625 4.675 5.65

Indiana Harbor, Ind. I-2 4.725 4.625 4.675 5.65

Johnstown, Pa. B2 4.725 4.625 4.675 5.65

Lackawanna, N.Y. B2 4.725 4.625 4.675 5.65

Minnequa, Colo. C10 4.725 4.625 4.675 5.65

Steelton, Pa. B2 4.725

## SEAMLESS STANDARD PIPE, Threaded and Coupled

Size-Inches	2	2½	3	3½	4	5	6	
List Per Ft	37c	58.6c	76.5c	92c	\$1.09	\$1.48	\$1.92	
Pounds Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25
Ambridge, Pa. N2	6.5	..	10.5	..	13	..	14.5	..
Lorain, O. N3	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25
Youngstown Y1	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25

## ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Youngstown R2	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.2
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## BUTT WELD STANDARD PIPE, Threaded and Coupled

Size-Inches	¾	1	1½	2	2½	3	3½	4
List Per Ft	5.5c	6c	6c	6c	8.5c	11.5c	17c	23c
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28	2.88
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Alton, Ill. L1	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Benwood, W. Va. W10	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Butler, Pa. F6	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Etna, Pa. N2	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Fairless Hills, Pa. N3	16.5	+0.75	19.5	3.75	22	6.75	24.5	8
Fontana, Calif. K1	7	+10.25	10	+6.25	12.5	+2.75	15	+1.5
Ind. Harbor, Ind. Y1	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Lorain, O. N3	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Sharon, Pa. S4	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Sharon, Pa. M6	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Sparrows Pt., Md. B2	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Youngstown R2, Y1	18.5	1.25	21.5	5.25	24	8.75	26.5	10
Wheatland, Pa. W9	17.5	+1.75	20.5	4.25	23	7.75	25.5	9

Size-Inches	1½	2	2½	3	3½	4
List Per Ft	27.5c	37c	58.5c	76.5c	92c	\$1.09
Pounds Per Ft	2.73	3.68	5.82	7.62	9.20	10.89
	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27.5	11.5	29	11.75	29	11.75
Alton, Ill. L1	24	8	26	8.75	26	8.75
Benwood, W. Va. W10	27	11	29	11.75	29	11.75
Etna, Pa. N2	27	11	29	11.75	29	11.75
Fairless Hills, Pa. N3	25	9	27	9.75	27	9.75
Fontana, Calif. K1	15.5	+0.5	16	0	17.5	0.25
Ind. Harbor, Ind. Y1	26	10	28	10.75	28	10.75
Lorain, O. N3	27	11	29	11.75	29	11.75
Sharon, Pa. M6	27	11	29	11.75	29	11.75
Sparrows Pt., Md. B2	24	8	26	8.75	26	8.75
Youngstown R2, Y1	27	11	29	11.75	29	11.75
Wheatland, Pa. W9	26	10	28	10.75	28	10.75

\*Galvanized pipe discounts based on current price of zinc (13.00c, East St. Louis).

## Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Revolving Ingot	Revolving Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F.		C.R. Strip; Flat Wire
						Bars; Wire	Plates	
201	17.00	21.50	31.00	36.25	33.50	36.75	38.75	39.00
202	18.25	24.00	31.00	36.25	33.50	38.75	42.50	42.50
301	17.75	22.25	31.75	36.75	32.00	38.00	40.00	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	47.00
303	26.75	34.75	40.00	41.00	42.75	42.75	52.25	52.25
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25
304L	21.75	28.25	35.50	40.25	42.25	45.25	48.00	52.25
305	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75
314	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25
316	42.25	56.25	64.75	73.50	73.50	75.25	78.75	83.25
316L	37.25	48.25	62.75	72.75	68.50	73.50	75.25	78.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50
403	28.75	32.75	32.75	32.75	34.00	36.25	43.75	43.75
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25
416	26.00	30.00	31.00	36.00	37.75	37.25	40.75	47.00
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	47.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75
430F	26.50	30.50	31.50	36.00	37.75	37.25	40.75	47.00
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00
446	35.50	40.50	53.25	62.00	43.25	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co. Inc.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

## Clad Steel

Stainless:	Plates		Sheets
	Carbon Base	20%	
302	30.30	36.05	30.50
304	32.30	37.95	32.50
304-L	41.30	47.00	..
316	35.50	41.40	47.00
316-L	40.00	46.10	..
316-CB	41.15	43.45	..
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	..
410	25.30	32.85	..
430	25.30	32.85	..
Inconel	49.45	65.45	..
Nickel	41.05	55.65	..
Nickel, Low Carbon	43.25	60.05	..
Monel	42.35	56.35	..
Copper*	..	..	46.00

Copper*	Strip, Carbon Base	
	10%	Both Sides
..	30.00	38.00

\*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

## Tool Steel

Grade	\$ per lb	Grade	\$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	H1-Carbon-Cr	0.770

Grade by Analysis (%)						\$ per lb
W	Cr	V	Co	Mo		
20.25	4.25	1.6	12.25	...	4.090	
18.25	4.25	1	4.75	...	2.305-2.475	
18	4	2	9	...	2.675-2.675	
18	4	2	...	...	1.765	
18	4	1	...	...	1.600	
13.75	3.75	2	5	...	2.245	
13.5	4	3	...	...	1.865	
9	3.5	...	...	...	1.180	
6	4	2	...	5	1.105	
6	4	3	...	6	1.350	
1.5	4	1	...	8.5	0.980	

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.



# Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer		Basic	No. 2 Foundry	Malleable	Bessemer
<b>Birmingham District</b>					<b>Youngstown District</b>				
Alabama City, Ala. R2	54.50	55.00†			Hubbard, O. Y1			59.00	
Birmingham R2	54.50	55.00†			Sharpville, Pa. S6	58.50		59.00	59.50
Birmingham U6		55.00†	59.00		Youngstown Y1			59.00	59.50
Woodward, Ala. W15	54.50	55.00†	59.00		Youngstown U5	58.50			59.50
Cincinnati, deld.		62.70			Mansfield, O., deld.	63.40		63.90	64.40
<b>Buffalo District</b>					Duluth I-3	58.50	59.00	59.00	59.50
Buffalo H1, R2	58.50	59.00	59.50	60.00	Erie, Pa. I-3	58.50	59.00	59.00	59.50
Tonawanda, N.Y. W12	58.50	59.00	59.50	60.00	Everett, Mass. E1	62.00	62.50	63.00	
N. Tonawanda, N.Y. T9		59.00	59.50	60.00	Fontana, Calif. K1	64.50	65.00		
Boston, deld.	69.15	69.65	70.15		Geneva, Utah C11	58.50	59.00		
Rochester, N.Y. deld.	61.52	62.02	62.52		Granite City, Ill. G4	60.40	60.90	61.40	
Syracuse, N.Y. deld.	62.62	63.12	63.62		Ironton, Utah C11	58.50	59.00		
<b>Chicago District</b>					Lone Star, Texas L6		55.00*		
Chicago I-3	58.50	59.00	59.00	59.50	Minnequa, Colo. C10	60.50	61.00	61.50	
Gary, Ind. U5	58.50		59.00		Rockwood, Tenn. T3		55.00†	59.00	
S. Chicago R2	58.50		59.00		Toledo, O. I-3	58.50	59.00	59.00	59.50
S. Chicago, Ill. Y1	58.50	59.00	59.00	59.50	Cincinnati, deld.	64.26	64.76		
S. Chicago, Ill. U5, W14	58.50		59.00	59.50					
Milwaukee, deld.	60.67	61.17	61.17	61.67					
Muskegon, Mich. deld.		65.30	65.30						
<b>Cleveland District</b>									
Cleveland A7, R2	58.50	59.00	59.00	59.50					
Akron, O., deld.	61.25	61.75	61.75	62.25					
Lorain, O. N3	58.50			59.50					
<b>Mid-Atlantic District</b>									
Bethlehem, Pa. B2	60.50	61.00	61.50	62.00					
New York, deld.		64.78	65.28						
Newark, deld.	63.52	64.02	64.52	65.02					
Birdsboro, Pa. B10	60.50	61.00	61.50	62.00					
Chester, Pa. P14	60.50	61.00	61.50						
Philadelphia, deld.	62.16	62.66	63.16						
Steelton, Pa. B2	60.50	61.00	61.50	62.00					
Swedeland, Pa. A3	60.50	61.00	61.50	62.00					
Philadelphia, deld.	62.16	62.66	63.16	63.66					
Troy, N.Y. R2	60.50	61.00	61.50	62.00					
<b>Pittsburgh District</b>									
Neville Island, Pa. P6	58.50	59.00	59.00						
Pittsburgh (N&S sides),									
Alliquippa, deld.		60.37	60.37	60.87					
McKees Rocks, deld.		60.04	60.04	60.54					
Lawrenceville, Homestead,									
Wilmerding, Monaca, deld.		60.66	60.66	61.16					
Verona, Trafford, deld.	60.69	61.19	61.19	61.69					
Brackenridge, deld.	60.95	61.45	61.45	61.95					
Bessemer, Pa. U5	58.50		59.00	59.50					
Clairton, Rankin, S. Duquesne, Pa. U5	58.50								
McKeesport, Pa. N3	58.50			59.50					
Midland, Pa. C18	58.50								

\*Phos. 0.51-0.75%; \$56, Phos. 0.31-0.50%.  
†Intermediate (Phos. 0.31-0.69%), \$56.

## PIG IRON DIFFERENTIALS

**Silicon:** Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

**Manganese:** Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

**Nickel:** Under 0.05% no extra; 0.50-0.74%, inclusive, add \$2 per ton and each additional 0.25%, add \$1 per ton.

## BLAST FURNACE SILVER PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add \$1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. G2, J1 ..... \$67.50  
Buffalo H1 ..... 68.75

## ELECTRIC FURNACE SILVER PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1 for each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max P)  
Niagara Falls, N.Y. P15 ..... \$91.00  
Keokuk, Iowa, (Open-hearth & Fdry, freight allowed K2) ..... 95.50  
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2 ..... 98.50

## LOW PHOSPHORUS PIG IRON, Gross Ton

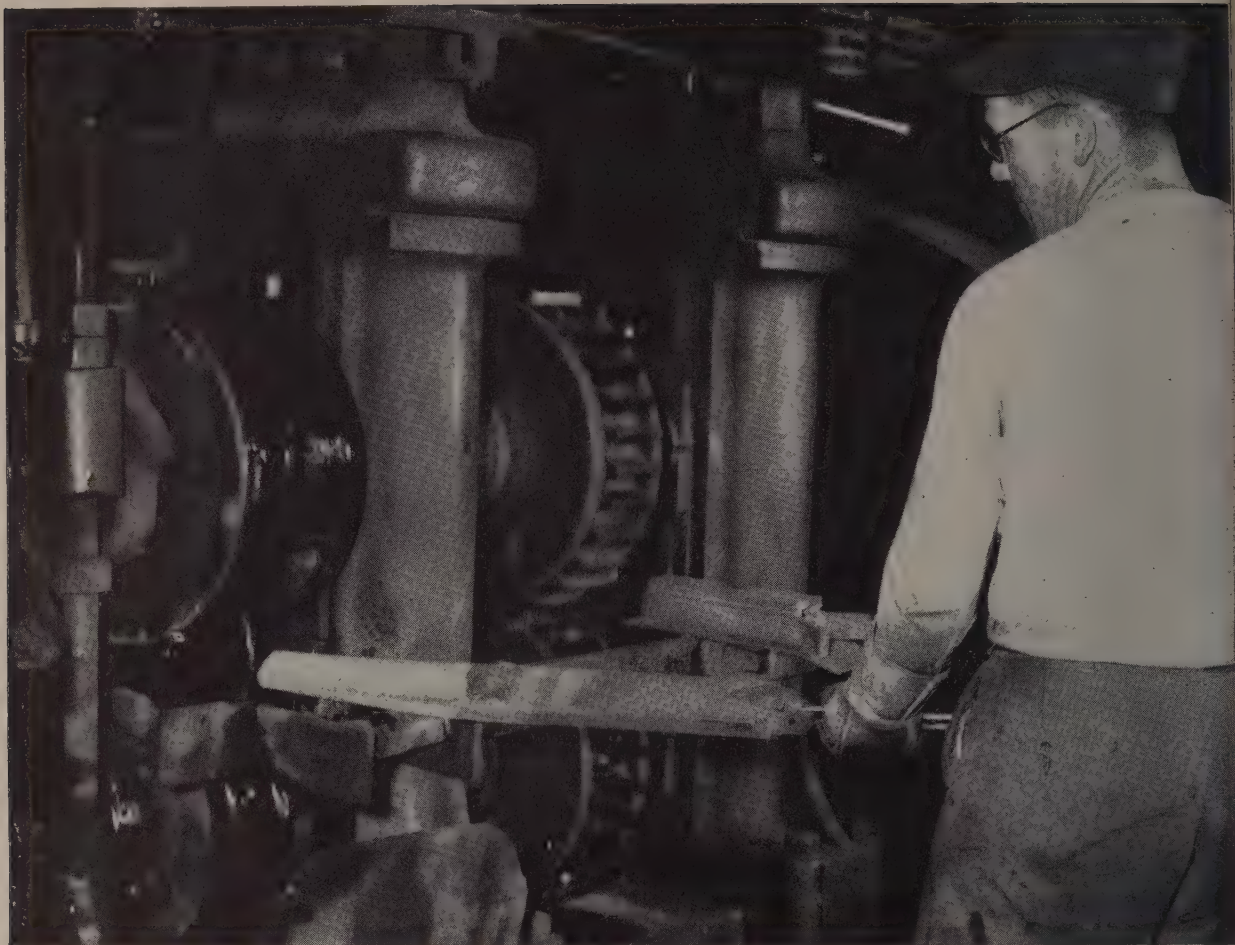
Lyles, Tenn. T3 (Phos. 0.035% max) ..... \$72.50  
Rockwood, Tenn. T3 (Phos. 0.0035% max) ..... 72.50  
Steelton, Pa. B2 (Phos. 0.035% max) ..... 70.05  
Philadelphia, deld. .... 70.05  
Troy, N.Y. R2 (Phos. 0.035% max) ..... 68.50  
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max) ..... 63.50  
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max) ..... 63.50  
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max) ..... 63.50  
Pittsburgh P6 (Intermediate) (Phos. 0.036-0.075% max) ..... 63.50

# Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except; Erie, 30 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Buffalo, Chicago, Chattanooga, Cincinnati, Cleveland, Jackson, Milwaukee, St. Louis, 15 cents; Baltimore, Boston, Los Angeles, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, New York, no charge.

	SHEETS		Gal. 10 Ga.†	Stainless Type 302	STRIP		BARS		H.R. Alloy 4140††	Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled			H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡			Carbon	Floor
Atlanta	7.14	8.20	8.87		7.40		7.42	9.39		7.63	7.49	9.48
Baltimore	7.08	8.32	8.37		7.65		7.66	8.62‡	13.44	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85		7.06		7.08	9.35		7.28	6.99	9.10
Boston	7.70	8.81	10.27	45.67	7.96		7.83	9.53	14.45	8.13	7.89	9.36
Buffalo	7.00	8.05	9.77		7.30		7.30	7.90	13.10	7.55	7.30	8.55
Chattanooga	6.95	8.10	8.60		7.20		7.20	9.18		7.45	7.25	9.05
Chicago	7.00	8.24	8.65	49.05	7.21		7.27	7.75	12.85	7.43	7.14	8.61
Cincinnati	7.12	8.23	9.05	46.10	7.45		7.51	8.05	13.09	7.90	7.43	8.86
Cleveland	7.00	8.24	8.95	49.16	7.31		7.33	7.85	12.91	7.76	7.31	8.78
Detroit	6.99	8.28	8.78	43.50	7.34		7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	6.80	7.90	8.85		7.15		7.08	7.85		7.40	7.15	8.63
Houston	7.85	8.75	10.49		8.15		8.25	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20		7.40		7.40	9.44		7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00		8.35		8.05	10.70	14.25	8.30	8.05	10.25
Milwaukee	7.09	8.33	8.74		7.30		7.36	7.94	12.94	7.60	7.23	8.70
Moline, Ill.	7.15	8.44	8.85		7.41		7.43	8.10		7.63	7.34	
New York	7.71	8.94	9.64	44.95	8.27		8.21	9.68	13.28	8.19	7.96	9.39
Norfolk, Va.	7.25				7.65		7.65	9.50		7.95	7.45	8.95
Philadelphia	7.19	8.42	9.35	45.98	7.67	9.02	7.68	8.46	13.16	7.74	7.37	8.69**
Pittsburgh	6.80	8.09	9.20	49.00	7.18		7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65		8.00		7.95	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.00		9.47		7.65		7.70	8.85		7.95	7.20	9.10
St. Louis	7.29	8.53	9.34	43.89	7.50		7.56	8.14	13.14	7.83	7.43	8.90
St. Paul	7.46	8.69	9.16		7.72		7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35		8.05	11.20	14.25	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65		8.40	11.70	14.65	8.30	8.20	10.10
Spokane	8.55	11.00†	10.80		9.05		8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97		8.12		8.05	9.09		8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12 50-cent zinc), except in Birmingham (coating extra excluded); †includes 35-cent special bar quality extras; \*\*¼-in. and heavier; ††as annealed; ‡§under ½-in.  
Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ‡—500 to 9999 lb; §—400 to 999 lb; ¶—4000 lb and over; †—1000 to 1999 lb; ‡—1000 lb and over; ¶—1500 to 3999 lb; §—2000 to 3999 lb; ¶—f.o.b. local delivery in lots of 10,000 lb and over.



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**ADDRESS DEPT. S-731**

The John Deere Plow Works of Deere & Company formerly used cast grey-iron dies to swage AISI 1070 F steel plow beams. Die life was, at best, a mere six weeks or about 8,000 parts.

They switched to A-L CAST-TO-SHAPE swaging dies of FCC No. 66 tool steel, hardened and drawn to 57-58 Rockwell "C". The new dies ran *fourteen months*—eight hours a day, five days a week—before redressing was necessary. Approximately **83,875 Parts** (over ten times the pro-

duction) were swaged in that period! Production has been maintained at that level since.

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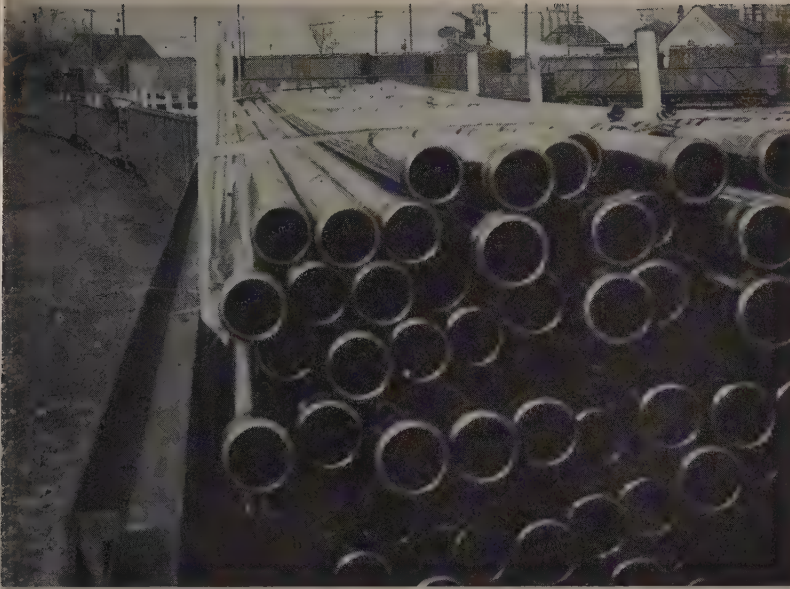
For complete **MODERN** Tooling, call  
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W&D 4697

**STEEL**





Republic Steel Corp.

*A revolution in carload pipe pricing meets a snag as . . .*

# Jobbers Protest Pipe Policy

A REVOLUTION in the pricing of standard galvanized pipe and line pipe which began in December is meeting with setbacks in January.

National Tube Division, U. S. Steel Corp., last week notified its jobbers that they will be allowed to solicit direct shipment business and get the 5-per-cent discount which the producer withdrew last Dec. 13. But the ban on the "functional" discount for shipments to jobbers' stocks is maintained by all producers. This means there is still a dual-price structure (the bone of contention) with regard to the business of jobbers.

**In the Beginning**—The whole situation arose, according to the producers, because some jobbers were cutting prices to the bone and underbidding on pipe contracts just so they could get the "accessory" business, on which they could make more money. M. W. Dennison, president, Braman, Dow & Co., Boston, a National Tube jobber, in protesting the original action, said: "We deplore the blindness of those who have played fast and loose, but we say that the cure is too drastic and does not have our approval . . . If other mills intend to allow their distribu-

tors to continue to solicit direct carload shipments and will give them a functional discount, you have not solved the problem."

Mr. Dennison also expressed the opinion of many jobbers when he said: "For our part, we want to believe that you have no intention to make all direct sales eventually without regard to your warehouse customers. Yet your step to come between us and our carload consumers . . . puts your distributors in a position which we hope they all will protest."

**Sore Spot**—By its action last week, National Tube returned its jobbers to a status virtually equal with jobbers for other producers. But the matter of no discount for shipments to their stocks is still a sore spot.

The historic markup in the pipe business since the late twenties has been 25 to 30 per cent over the consumer's parallel price. Now that the producers have withdrawn the discount, the jobber must boost the price 5 per cent if he is to make the same profit as before. Mr. Dennison claims this will mean a hike of \$7.50 a ton on warehouse pipe. The jobbers claim that this exerts an economic pressure for consumers to buy car-

loads directly from the mills and bypass them. Mr. Dennison questions the advisability of mills charging \$100 for pipe going into jobbers' stocks when the same pipe would go for only \$95 on jobbers' direct sales to consumers.

**Protest Meeting**—Last week in Chicago, distributors in that area scheduled a meeting for next Thursday to discuss this matter. Another meeting reportedly is being held in Cleveland tomorrow (Tuesday) at which National Tube will explain to its jobbers the reasons for this new policy. National Tube officials could not be reached to confirm or deny this report.

Producers say this new policy is just another logical step in setting up a one-price standard for all steel products. Other mill items have been sold on this basis for some time. Mr. Dennison believes the policy is unrealistic for pipe because "about 50 per cent of merchant pipe is sold to warehouse stock, and, currently, some 20 per cent more through direct carload sales made by distributors."

**More Profit**—Pipe producers claim there was little thought given to the fact that elimination of the discount would mean a bigger profit on the pipe they sell. But they admit that costs have advanced and every little bit helps to balance the books.

As for line pipe, one producer says the new policy is simply a continuation of a long-term trend toward more purchasing of the pipe by the direct consumer. Some line pipe is not sold through jobbers at all.

## Tubular Goods . . .

*Tubular Goods Prices, Page 118*

Demand continues strong for all tubular goods. From all indications, say pipe mill sales managers, this will prove to be heavy volume year in line pipe and oil country goods. Standard pipe business may be off slightly from that placed in 1955, especially should a decline in home building be experienced.

Recent changes in discounts on butt-weld standard pipe resulted in no noticeable change in demand, according to the mills.

Cast iron pipe demand is still in a between-season slump. Sales agencies, notably in the Pacific Northwest, expect buying interest to develop soon. Unfavorable weather is a retarding influence in the market.

On the whole, cast iron pipe business this year is expected to be at least equal to that done in 1955, an unusually good year.

## Sheets, Strip . . .

Sheet & Strip Prices, Pages 113 & 114

Some easing in automotive demand at this time may result in a slightly larger tonnage in the second quarter for other sheet consumers. They realize, however, that supply will fall short of what they would like to have.

Sheet producers do not view with alarm reports of a gradual decline in automotive needs. There's no change in shipments from some districts, including Pittsburgh. First effect of lower automotive requirements appeared in reports of fewer emergency requests for tonnage from warehouses

and a decline in interest in conversion deals. Sheetmakers believe they won't experience any important change until late second or early third quarter. And then they will welcome the chance to ship larger supplies to other customers.

Several mills will begin their 1956 expansion programs soon. At first they will have to slow down production, making sheet harder to obtain.

Leading sheet sellers believe that by the end of this quarter they will have their arrearages reduced considerably—not by a decline in demand, but because of greater restraint on their part in accepting new

tonnage. One leading producer believes that arrearages will be cut to about two weeks on hot and cold rolled sheets, compared with four to five weeks at the start of this quarter. On galvanized sheets, one leading producer is practically current.

Some producers indicate they will open second quarter books within two or three weeks. One mill plans to start booking tonnage for second quarter on hot and cold-rolled sheet early in February. Demand from stovemakers, cabinet makers and meter manufacturers continues exceedingly brisk.

Untempered spring steel strip has advanced generally \$2 a ton. Other increases are in the making. More buying for second quarter delivery will be predicated on the price factor.

## Belgian Steel Bar Price Up

The minimum price for Belgian steel bars exported to the U. S. and Canada has been increased from \$102 to \$105, f.o.b. Antwerp. Among steel products supplied to North America at prices under those for shipments to other countries were bars, beams and channels. Prices of these products have been raised to remove the differential. Plates and bars used in shipbuilding, for example, now are quoted at \$145 and \$135, respectively, for any destination. These prices were \$135 and \$125.

## Steel Bars . . .

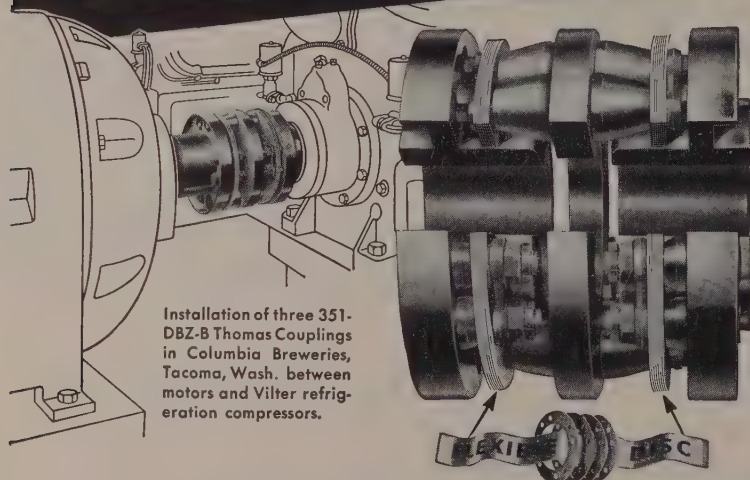
Bar Prices, Page 112

Sellers of hot-rolled carbon steel bars may open their books for second quarter business within three weeks. If they follow policy ruling in this quarter, they will accept business for the next contracting period largely on a month-to-month basis.

Most producers appear confident they will have small carry-over at the end of the first quarter—not because of slower demand, but because of the more careful scheduling of the last couple of months. Cutbacks in automotive needs may ease supply conditions a little, with the possibility of some spot openings appearing. Most mills think any openings will simply erase a little of the overload which couldn't be handled anyway.

Alloy barmakers have filled most agricultural equipment and lawn-mower needs for the 1956 season. They have some open space in their schedules. The pulp and paper industry's alloy bar requirements are reported heavy, and these are taking up some of the slack that has developed in this area of the market.

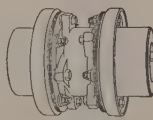
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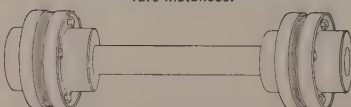
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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FACTS	EXPLANATION
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Nickel shortages are holding back production to some extent.

Effective Jan. 10, Bliss & Laughlin Inc. adjusted various extras in its prices for cold-finished carbon steel bars. Advances became necessary because of the recent increase in the cost of hot-rolled carbon bars. Effective Jan. 11, the company announced an adjustment of 35 cents per 100 cwt in the base price of cold-finished steel bars. This amount previously was assessed for standard bar quality, an extra that no longer will be used.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 112

Sellers of reinforcing steel are feeling the impact of the extremely tight situation in structural steel. Extended delivery promises for fabricated structurals are causing many engineers to switch to reinforced concrete construction on some jobs. This adds to the present tightness in concrete bars and accessories. Not all new business offered can be accepted by the mills. A shortage of cement also serves as a deterrent.

Rolling mill operations are again in full swing in the Pacific Northwest, with prospects bright for continued active demand from building for reinforcing steel. Bar order backlogs in the area are reported off, but much new work is pending. Several changes in size extras were announced recently, but no change was effected in base prices.

## Plates . .

Plate Prices, Page 112

Backlogs of tank fabricators continue to expand. Some shops are booked a year ahead on the basis of plates they can reasonably expect to obtain from mills. While most shops can operate on a single shift, five-day-a-week schedule, many could turn out more tonnage were more plates available.

Demands of the oil and chemical industries are as great as at any time in months. Fabricators of water tanks report demand is well sustained from both industrial and governmental sources.

Tank prices are firming, but, with deliveries extended, the shops still have a pricing problem. This is particularly true with regard to public work on which firm prices are required—instead of those set up on an escalator basis. At least one large fabricator in the East, in quoting firm prices, is allowing for an increase in steel costs of at least \$12 a ton after July 1.

Plate mills are making some progress in catching up on tonnage ar-

rearages as result of blankouts and more careful booking of new orders. At least some hope is held that by end of this quarter the mills will be reasonably current with demand. Demand is still far in excess of supply.

Expectations are that plate requirements for roadwork, industrial construction and freight cars will increase. Construction firms are trying to build inventories in advance of their busy season. They are meeting with little success.

Plate fabricators are figuring several sizable projects, including fuel storage facilities, at several Alaskan bases.

## Tool Steel . . .

Tool Steel Prices, Page 116

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 10,615 net tons in November, reports the American Iron & Steel Institute. This was slightly up from the 10,095 tons shipped in the preceding month and was up sharply from the 7158 tons in November, 1954.

Cumulative shipments in the first 11 months of 1955 were 103,752 tons. This compares with 76,679 in the like period of 1954.

Crucible Steel Co. of America in-



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## Ores

### Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	\$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.10
Mesabi nonbessemer	10.95
Open-hearth lump	12.10

### Eastern Local Iron Ore

Cents per unit, deld. E. Pa.	
Foundry and basic 62-62% concentrates	
contract	17.00-18.00

### Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports	
Swedish basic, 60-68%	20.00
N. African hematite (spot) nom.	18.00-20.00
Brazilian iron ore, 68-69% (spot)	26.00-28.00

### Tungsten Ore

Net ton unit, before duty	
Foreign, wolframite, good commercial	
quality	\$30.00-\$31.00
Domestic, scheelite, mine	63.00

### Manganese Ore

Mn 48%, nearby, \$1.06-\$1.11 per long ton unit, c.i.f. U. S. ports, duty for buyer's account;	
46-47%, 95c-\$1.00.	

### Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for deliver to Portland, Oreg., Tacoma, Wash.

Indian and African	
48% 2.8:1	nom. \$45.00-\$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

### South African Transvaal

44% no ratio	\$19.00-\$20.00
48% no ratio	33.00-35.00

### Domestic

18% 3:1	\$39.00
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### Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	\$1.00
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### Antimony Ore

Per unit of Sb content, c.i.f. seaboard	
55-60%	\$3.60-\$3.85
60-65%	3.85-4.00

### Vanadium Ore

Cents per lb V <sub>2</sub> O <sub>5</sub> content, deld. mills	
Domestic	\$1.00

## Refractories

### Fire Clay Brick (per 1000)

**High-Heat Duty:** Ashland, Grahm, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., \$122; Salina, Pa., \$127; Niles, O., \$133.

**Super-Duty:** St. Louis, \$150.

### Silica Brick (per 1000)

**Standard:** Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensey, Ala., Portsmouth, O., Hawstone, Pa., \$128; Warren, Niles, O., Hays, Pa., \$133; Morrisville, Pa., \$131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., \$138; Lehigh, Utah, \$144; Los Angeles, \$151.

**Super Duty:** Hays, Sproul, Hawstone, Pa., Warren, Windham, O., Athens, Tex., \$145; Morrisville, Pa., Niles, O., \$148; Joliet, Ill., \$151; Curtner, Calif., \$163.

### Semisilica Brick (per 1000)

Clearfield, Pa., \$139; Philadelphia, \$124; Woodbridge, N. J., \$122.

### Ladle Brick (per 1000)

**Dry Pressed:** Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., \$88.50; Wellsville, O., \$92.50; Clearfield, Pa., Portsmouth, O., \$98.

### High-Alumina Brick (per 1000)

**50 Per Cent:** St. Louis, Mexico, Mo., \$194; Danville, Ill., \$197; Philadelphia, Clearfield, Pa., \$201.

**60 Per Cent:** St. Louis, Mexico, Vandalia, Mo., \$241; Danville, Ill., \$244; Philadelphia, Clearfield, Pa., \$248.

**70 Per Cent:** St. Louis, Mexico, Vandalia, Mo., \$279; Danville, Ill., \$281; Clearfield, Pa., Philadelphia, \$286.

### Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$157; Clearfield, Pa., \$158.50; St. Louis, \$169.30.

### Nozzles (per 1000)

Reesdale, Pa., \$253.70; Johnstown, Pa., \$259.20; Clearfield, Pa., \$259.40; St. Louis, \$259.45; Bridgeburg, Pa., \$258.

### Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$196; Clearfield, Pa., \$198; St. Louis, \$195.80.

### Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Nario, O., \$15; Thornton, McCook, Ill., \$15.60; Dolly Siding, Bonne Terre, Mo., \$14.

### Magnesite (per net ton)

Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., \$40; Luning, Nev., \$40. ¾-in. grains with fines: Baltimore, \$66.40.

## Metallurgical Coke

### Price per net ton

**Beehive Ovens**  
Connellsville, furnace \$13.75-14.50  
Connellsville, foundry 16.00-17.00

### Oven Foundry Coke

Birmingham, ovens	\$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Buffalo, deld.	28.75
Camden, N. J., ovens	26.50
Chicago, ovens	27.00
Cincinnati, deld.	28.50
Detroit, ovens	27.50
Detroit, deld.	28.50
Pontiac, deld.	29.06
Saginaw, deld.	30.58
Eric, Pa., ovens	27.50
Everett, Mass., ovens	
New England, deld.	*28.55
Indianapolis, ovens	26.75
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island, (Pittsburgh) Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
St. Paul, ovens	26.50
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

\*Or within \$4.55 freight zone from works.

## Coal Chemicals

### Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

### Per ton, bulk, ovens

Ammonium sulphate	\$42-\$45
Birmingham area	\$42.00†

†With port equalization against imports.

Cents per pound, producing point  
Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 18.50; Grade 5, 15.25.

## Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content 72.5%, \$38-\$39; 70%, \$35-\$36; 60%, \$31-\$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, \$34; Mexican, \$26.50.

## Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE		
Diam	Inches	Length
2	24	\$32.50
2 ½	40	33.75
3	40	32.00
4	40	30.25
5 ½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25
CARBON		
8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
24	90	10.10
24	72, 84	10.30
30	96	10.05
34	84	10.20
40, 35	110	9.90
40	100	9.90

creased the base price of one of its high-speed steel grades (Rex 7) to 99 cents per pound from 96 cents (effective Jan. 3). This grade was used chiefly for small cutting tools.

## Alloy Steel . . .

Production of alloy steel ingots in November (other than stainless and heat resisting) totaled 845,080 net tons, reports the American Iron and Steel Institute. The bulk of output (652,400 tons) was in the constructional grades. High strength steel accounted for 87,225 tons and silicon sheet steels, 105,455 tons. Of the total output, 819,559 tons were nonboron and 25,521 tons, boron.

In the first 11 months of 1955, output was 8,422,268 tons, of which 8,115,756 tons were nonboron, and 306,512 boron. The bulk of production, 6,499,549 was in the constructional specifications; 764,806 tons were high-strength steels; and 1,157,911 tons, silicon sheet steels.

## Wire . . .

Wire Prices, Pages 114 & 115

Pressure for valve spring wire has eased slightly. There are no cancellations or heavy shipment deferrals, but the urgency for deliveries appears to be easing. This is seen as reflecting some letup in automotive requirements since valve spring wire is usually high in auto needs.

Demand for most grades of finished wire has filled first quarter schedules. Producers of high carbon specialties are making little progress toward reducing backlogs. December bookings were in excess of shipments and continue heavy.

Users of highway accessories are alerted for peak demand this spring. Most of them are pressing for steel shipments.

Wire deliveries, in general, continue extended, but the wire mills are more nearly in step with their schedules than are those mills turning out light flat-rolled steel. Carryovers are not so serious a problem in booking new wire orders.

Crucible Steel Co. of America has adjusted base prices on cold-finished stainless steel wire, ½-in. in diameter and under, and on stainless steel hot-rolled wire rods. New extras announced reflect higher finishing costs on cold-finished bars and wire.

Several producers of bright manufacturers wire have announced price increases on bright wire and on wire rods similar to those effected by U. S. Steel Corp. late in December.

Copperweld Steel Co., Glassport



Pa., is low bidder on 600,000 squares, noncorrosive reinforcing fabric; 10.2 million side-twist wires, and 1.5 million end-twist wires, for the Corps of Engineers, Memphis, Tenn.

## Warehouse . . .

Warehouse Prices, Page 117

Warehouse steel demand continues strong. No change in the tight supply situation is likely to develop during the first half of the year.

Early this month several distributors increased prices on various products 15 to 20 cents per 100 lb. Carbon steel products which increased 15 cents include cold-rolled sheets, galvanized sheets, hot-rolled strip, shapes, plates and floor plates. In most districts, hot-rolled merchant bars advanced 19 cents; hot-rolled sheets, 20 cents. In most districts, hot-rolled special quality bars are priced 53 to 56 cents per 100 lb over merchant bars. Other products appear due for a revision soon.

Charges for delivery were revised. Delivery charges were reduced to 15 cents from 25 cents in Chicago, St. Louis, Cincinnati and Milwaukee; to 15 cents from 30 cents in Cleveland and Buffalo. There is no charge for delivery from warehouses to points in the metropolitan New York area, compared with 10 cents previously.

Fewer emergency requests for

sheets are being received by distributors in the Pittsburgh district.

## Rails, Cars . . .

Track Material Prices, Page 115

The second largest freight car order placed in the East in recent years involves 11,200 units for the Pennsylvania Railroad. All cars were placed with the road's own shops, chiefly the Altoona, Pa., works.

## Pig Iron . . .

Pig Iron Prices, Page 117

Pig iron consumers, especially the larger ones, are stepping up their purchases in an effort to beat a possible price increase. Raw materials entering into the production of pig iron have been increasing, along with ferroalloys and various other commodities. A proposed freight rate increase of 7 per cent late next month, if approved by the Interstate Commerce Commission, will have a stimulating effect on costs of all materials.

Prices on foundry grades of scrap are at a high level, making it economically desirable in many instances for foundrymen to increase the pig in their melts.

Foundry operations are increasing steadily toward preholiday levels. Gray iron and malleable shops are operating at about normal capacity.

## Steel Tops 117-Million Mark

Record-breaking production of 117,000,566 net tons of steel in 1955 is reported by the American Iron & Steel Institute. Output exceeded the previous peak, established in 1953, by 5,390,847 tons. The 1954 total was topped by 28,688,914 tons.

The final quarter of 1955, with three consecutive 10-million-ton months, set a record for any quarter. Total output for the period was 31,216,448 tons, compared with 28,577,816 in the preceding three months.

Nearly 59.8 million tons were produced in the last six months of 1955, against 57.2 million in the first half.

In December, the production totaled 10,468,000 tons, a record for that month and comparing with 10,247,398 tons in November, and 8,287,073 in December, 1954.

The institute's preliminary figures showed that steelmaking furnaces were operated at an average of 93 per cent of capacity last year, 98.4 per cent during the fourth quarter and 98.1 per cent in December. In 1955, capacity was rated at 125.8 million tons annually. As of Jan. 1, 1956, it was up to 128,363,090 net tons.

The index of production was 139.7 during 1955, 147.9 during the fourth quarter and 147.1 in December.

Period	OPEN HEARTH			BESSEMER			ELECTRIC			TOTAL			Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Per cent of capacity	Index	Net tons	Per cent of capacity	Index	Net tons	Per cent of capacity	Index	Net tons	Per cent of capacity	Index		
1955														
January	8,054,345	86.0	125.7	199,229	49.0	56.7	584,162	63.6	163.6	8,837,736	82.7	124.2	1,094,974	4.43
February	7,734,884	91.5	133.7	197,091	53.7	62.1	564,959	68.1	175.1	8,496,934	88.0	132.2	2,124,233	4.00
March	9,060,026	96.7	141.4	255,493	62.8	72.7	666,235	72.6	186.5	9,981,754	93.4	140.3	2,253,281	4.43
1st Quarter	24,849,255	91.4	133.6	651,813	55.2	63.9	1,815,356	68.1	175.1	27,316,424	88.0	132.3	2,124,139	12.86
April	8,585,549	97.7	142.9	275,069	69.8	80.9	681,477	76.6	197.2	9,315,095	94.8	142.6	2,287,901	4.29
May	9,307,291	99.4	145.3	305,347	75.1	86.9	715,678	77.9	200.4	10,328,316	96.6	145.2	2,331,448	4.43
June	8,764,430	96.6	141.4	283,544	72.0	83.4	698,493	78.6	202.1	9,746,467	94.1	141.6	2,271,904	4.29
2nd Quarter	26,930,270	97.9	143.2	863,960	72.3	83.8	2,095,648	77.7	199.9	29,889,878	95.2	143.1	2,297,454	13.01
1st 6 Months	51,779,525	94.7	138.5	1,515,773	63.8	73.9	3,911,004	72.9	187.5	57,206,302	91.6	137.7	2,211,299	25.87
July	8,232,535	88.1	128.5	268,348	66.1	76.4	600,063	65.5	168.0	9,100,946	85.3	127.9	2,059,038	4.42
August	8,600,612	91.8	134.3	298,972	73.5	85.1	694,000	75.7	194.6	9,694,545	89.7	134.9	2,165,812	4.43
September	8,829,266	97.6	142.4	307,171	78.2	90.3	745,888	84.1	215.8	9,882,325	95.7	143.5	2,308,954	4.28
3rd Quarter	25,662,413	92.4	135.0	874,491	72.6	83.9	2,040,912	75.0	192.5	28,577,816	90.2	135.4	2,176,528	13.13
9 Months	77,441,938	93.9	137.3	2,390,264	66.8	77.2	5,951,916	73.6	189.2	85,784,118	91.1	136.9	2,199,593	39.00
October	9,369,704	100.0	146.3	350,150	81.2	94.0	801,196	87.3	224.3	10,501,050	98.2	147.6	2,370,440	4.43
*November	9,141,244	100.8	147.5	306,674	77.9	90.2	799,480	89.9	231.3	10,247,398	99.0	148.8	2,388,671	4.29
†December	9,390,000	100.5	146.6	292,000	72.0	83.1	786,000	85.8	220.1	10,468,000	98.1	147.1	2,368,000	4.42
4th Quarter	27,900,948	100.0	146.8	928,824	77.0	89.1	2,386,676	87.6	225.2	31,216,448	98.4	147.9	2,375,681	13.14
†Last Half	53,563,361	96.4	140.9	1,803,315	74.8	86.5	4,427,588	81.3	208.9	59,794,264	94.3	141.6	2,276,143	26.27
†Total	105,342,886	95.6	139.7	3,319,088	69.3	80.2	8,338,592	77.2	198.3	117,000,566	93.0	139.7	2,243,969	52.14
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,665,508	4.43
1st Quarter	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.28
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,873	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
2nd Quarter	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,827,597	62.9	93.2	1,499,456	4.42
August	6,021,496	65.0	94.0	217,537	53.6	62.0	427,574	45.2	119.7	6,666,907	63.1	93.7	1,494,945	4.43
September	6,140,266	66.6	99.1	214,065	54.5	63.0	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Quarter	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.0	20,101,987	64.2	95.2	1,530,997	13.13
9 Months	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,019	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
October	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,495	4.43
November	7,307,151	81.4	117.9	231,191	58.7	68.0	551,085	64.1	159.4	8,089,427	79.1	117.7	1,885,647	4.29
December	7,530,204	81.4	117.8	231,126	57.0	65.8	525,743	59.4	147.2	8,287,073	78.6	116.5	1,874,903	4.42
4th Quarter	21,810,923	79.3	114.7	700,071	58.0	67.1	1,667,039	59.5	147.8	24,078,033	76.8	114.0	1,832,423	13.14
2nd Half	40,012,805	72.8	105.2	1,337,286	55.4	64.1	2,529,929	53.8	133.5	44,180,020	70.5	104.6	1,811,767	26.27
Total	80,327,494	73.6	106.5	2,548,104	53.2	61.6	4,436,054	52.0	129.3	88,311,652	71.0	105.4	1,693,741	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons open hearth, 91,810 net tons bessemer and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954, as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

\*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

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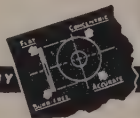


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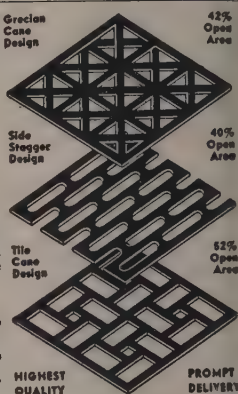
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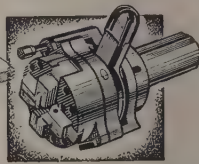
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## Scrap . . .

Scrap Prices, Page 126

**Pittsburgh** — Heavy pressure for scrap in neighboring areas has strengthened No. 1 heavy melting here, but the full effect of price increases in the Valley has not been felt. If a mill attempted to buy No. 1 heavy melting below \$54, it would have little success in view of higher prices in the Valley. No higher price than \$55 can be maintained here, due to lack of mill demand. Despite rising prices here, reports are spreading that a weakening of prices is beginning.

No. 2 grades enjoy a greater demand here than in the Valley. This leads to a smaller spread between the price of No. 1 and that of No. 2 heavy melting scrap in Pittsburgh. The price of No. 2 grades in Pittsburgh is roughly equivalent to prices quoted in the Valley, but the price of No. 1 grades lags behind Valley prices owing to sparse demand.

**Philadelphia**—Scrap prices generally are steady, with tonnage moving fairly freely. Dealers do not seem to be inclined to hold back to get higher prices. Still, there is no weakness, and with weather a complicating factor, no marked easing may develop for several weeks. The only change noted is a slight advance in couplers, springs and wheels to a flat \$60, delivered.

**New York**—Brokers have advanced their buying prices on a number of grades. They are offering \$49 to \$51 for No. 1 heavy melting and No. 1 bundles, \$46 to \$47 for No. 2 heavy melting and \$40 to \$42 for No. 2 bundles. They have boosted buying prices on machine shop turnings to \$29 to \$30; mixed borings and turnings to \$30 to \$31; short shovel turnings to \$32 to \$33; low phos plate to \$50 to \$52; and unstripped motor blocks to \$32 to \$33. Brisk demand for export, combined with active domestic requirements, is behind higher prices.

**Cleveland**—The scrap market has reacted sharply from the \$62 price paid in the Valley about ten days ago for No. 1 grades of production scrap. Later sales have been made at about \$4 under that price. The Valley market now is considered firmly established at \$57 to \$58 on the No. 1 grades. At Cleveland, No. 1 steel is available at \$54 to \$55, down from a week ago. The decline accompanies substantial receipts and the drying up of large buying by the mills, which, reportedly, are limiting purchases.

**Buffalo**—Price advances of \$1 to

\$7 a ton swept through the local scrap market last week on new buying which developed after a prolonged period during which new purchases were virtually nil. Steelmaking grades are up \$4 a ton on buying by area steel mills of about 15,000 to 20,000 tons. Cast iron scored sharp gains.

**Chicago**—The scrap market here is quiet, with trading at a minimum. But instead of weakness, there is watchful waiting on the part of consumers. In general, prices hold at the level of a week ago. So far this market is not sensitive to the sharp upward surge in the Mahoning valley—and observers doubt that it will be. Local steel mills are considered to have substantial inventories of scrap which serve as a stabilizing influence.

**Detroit**—There have been no above-normal scrap shipments from the Detroit area into the Youngstown district since the recent sharp surge in the Youngstown market in the closing week of 1955.

The jump in price on No. 1 heavy melting steel in the Valley was noted here. But local dealers and brokers are sitting tight in an effort to keep the market under control. As one

dealer says: "Right now, everyone is trying to soft pedal the market. There's no great desire to ship out of the Detroit area when you can get \$50 a ton right here. At those high prices, \$5 or \$10 doesn't mean too much."

Dealers feel that efforts to hold the market in line will succeed. There's a strong possibility that the market will break in the next few weeks. If that happens, there may be more shipments into outside areas.

**Cincinnati**—Brokers advanced their

(Please turn to page 128)

**Do you save  
money when  
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See Page No. 20

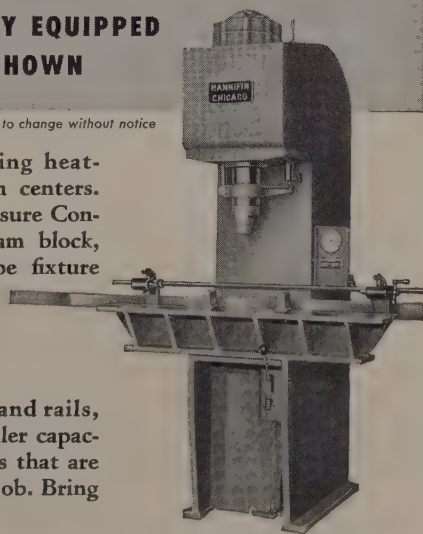
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# Iron and Steel Scrap

Consumer prices, per gross ton, STEEL. Changes shown in italics.

except as otherwise noted, including broker's commission, as reported to

## STEELMAKING SCRAP

### COMPOSITE

Jan. 11 .....	\$53.33
Jan. 4 .....	52.17
Dec. Avg. ....	50.37
Jan. 1955 .....	34.95
Jan. 1951 .....	46.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

## PITTSBURGH

No. 1 heavy melting...	54.00-55.00
No. 2 heavy melting...	48.00-49.00
No. 1 bundles .....	54.00-55.00
No. 2 bundles .....	44.00-45.00
No. 1 busheling .....	54.00-55.00
Machine shop turnings...	34.00-35.00
Mixed borings, turnings...	39.00-40.00
Short shovel turnings...	39.00-40.00
Cast iron borings .....	39.00-40.00
Cut structurals, 3 ft lengths .....	59.00-60.00
Heavy turnings .....	46.00-47.00
Punchings & plate scrap .....	59.00-60.00
Electric furnace bundles .....	54.00-55.00

### Cast Iron Grades

No. 1 cupola .....	46.00-47.00
Charging box cast .....	44.00-45.00
Heavy breakable cast .....	44.00-45.00
Unstripped motor blocks .....	32.00-33.00
No. 1 machinery cast .....	54.00-55.00

### Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
Rails, 2 ft and under .....	67.00-68.00
Rails, 18 in. and under .....	68.00-69.00
Rails, random lengths .....	63.00-64.00
Railroad specialties .....	59.00-60.00

### Stainless Steel Scrap

18-8 bundles & solids .....	335.00-350.00
18-8 turnings .....	220.00-230.00
430 bundles & solids .....	100.00-110.00
430 turnings .....	60.00-65.00

## CLEVELAND

No. 1 heavy melting...	54.00-55.00
No. 2 heavy melting...	45.00-46.00
No. 1 bundles .....	54.00-55.00
No. 2 bundles .....	42.00-43.00
No. 1 busheling .....	54.00-55.00
Machine shop turnings...	30.00-31.00
Mixed borings, turnings...	34.50-35.50
Short shovel turnings...	34.50-35.50
Cast iron borings .....	34.50-35.50
Low phos. .....	55.00-56.00
Cut structural plates 2 ft and under .....	61.00-62.00
Alloy free, short shovel turnings .....	37.00-38.00
Electric furnace bundles .....	55.00-56.00

### Cast Iron Grades

No. 1 cupola .....	56.00-57.00
Charging box cast .....	48.00-49.00
Stove plate .....	54.00-55.00
Heavy breakable cast .....	47.00-48.00
Unstripped motor blocks .....	38.00-39.00
Brake shoes .....	43.00-44.00
Clean auto cast .....	55.00-56.00
Burnt cast .....	43.00-44.00
Drop broken machinery .....	56.00-57.00

### Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
R.R. malleable .....	59.00-60.00
Rails, 2 ft and under .....	71.00-72.00
Rails, 18 in. and under .....	72.00-73.00
Rails, random lengths .....	65.00-66.00
Cast steel .....	60.00-61.00
Railroad specialties .....	60.00-61.00
Uncut tires .....	60.00-61.00
Angles, splice bars .....	66.00-67.00
Rails, rerolling .....	71.00-72.00

### Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids .....	340.00-350.00
18-8 turnings .....	200.00-210.00
430 clips, bundles, solids .....	105.00-115.00
430 turnings .....	55.00-65.00

## YOUNGSTOWN

No. 1 heavy melting...	58.00-59.00
No. 2 heavy melting...	48.00-49.00
No. 1 bundles .....	57.00-58.00
No. 2 bundles .....	44.00-45.00
No. 1 busheling .....	57.00-58.00
Machine shop turnings...	32.50-33.50
Short shovel turnings...	36.50-37.50
Cast iron borings .....	36.50-37.50
Low phos. .....	59.00-60.00
Electric furnace bundles .....	59.00-60.00

### Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
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## CHICAGO

No. 1 heavy melting...	49.00-52.00
No. 2 heavy melting...	40.00-41.00
No. 1 factory bundles...	52.00-53.00
No. 1 dealer bundles...	50.00-51.00
No. 2 bundles .....	40.00-41.00
No. 1 busheling .....	49.00-52.00
Machine shop turnings...	31.00-32.00
Mixed borings, turnings...	33.00-34.00
Short shovel turnings...	33.00-34.00
Cast iron borings .....	33.00-34.00
Cut structurals, 3 ft. .....	56.00-57.00
Punchings & plate scrap .....	57.00-58.00

### Cast Iron Grades

No. 1 cupola .....	51.00-52.00
Stove plate .....	43.00-44.00
Unstripped motor blocks .....	40.00-41.00
Clean auto cast .....	56.00-57.00
Drop broken machinery .....	56.00-57.00

### Railroad Scrap

No. 1 R.R. heavy melt.	54.00-55.00
R.R. malleable .....	64.00-65.00
Rails, 2 ft and under .....	69.00-70.00
Rails, 18 in. and under .....	70.00-71.00
Angles, splice bars .....	67.00-68.00
Rails, rerolling .....	72.00-73.00

### Stainless Steel Scrap

18-8 bundles & solids .....	335.00-350.00
18-8 turnings .....	240.00-250.00
430 bundles & solids .....	110.00-115.00
430 turnings .....	50.00-55.00

## DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	50.00
No. 2 heavy melting...	50.00
No. 1 bundles .....	50.00
No. 2 bundles .....	36.00
No. 1 busheling .....	50.00
Machine shop turnings...	23.00
Mixed borings, turnings...	23.00
Short shovel turnings...	27.00
Punchings & plate scrap .....	55.00

### Cast Iron Grades

No. 1 cupola .....	43.00
Charging box cast .....	37.00
Stove plate .....	37.00
Heavy breakable .....	35.00
Unstripped motor blocks .....	25.00
Clean auto cast .....	46.00
Malleable .....	42.00

## BIRMINGHAM

No. 1 heavy melting...	45.00-46.00
No. 2 heavy melting...	42.00-43.00
No. 1 bundles .....	45.00-46.00
No. 2 bundles .....	34.00-35.00
No. 1 busheling .....	45.00-46.00
Cast iron borings .....	19.00-20.00
Short shovel turnings...	30.00-31.00
Machine shop turnings...	29.00-30.00
Electric furnace bundles .....	48.00-49.00

### Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola .....	47.50-48.00
Stove plate .....	44.50-45.50
Bar crops and plate .....	54.00-55.00
Structural & plate, 2 ft. .....	54.00-55.00
Unstripped motor blocks .....	39.00-40.00
Charging box cast .....	32.00-33.00
No. 1 wheels .....	39.00-40.00

### Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
Rails, 18-in. and under .....	64.00-65.00
Rails, rerolling .....	64.00-65.00
Rails, random lengths .....	59.00-60.00
Angles, splice bars .....	61.00-62.00

## PHILADELPHIA

No. 1 heavy melting...	55.00
No. 2 heavy melting...	49.00
No. 1 bundles .....	55.00
No. 2 bundles .....	46.00
No. 1 busheling .....	55.00
Electric furnace bundles .....	56.00
Machine shop turnings...	38.00
Mixed borings, turnings...	38.00
Short shovel turnings...	40.00
Heavy turnings .....	51.00
Structurals & plate .....	58.00-60.00
Couplers, springs, wheels .....	60.00
Rail crops, 2 ft & under .....	67.00

### Cast Iron Grades

No. 1 cupola .....	51.00-53.00
Malleable .....	66.00
Heavy breakable cast .....	54.00
Drop broken machinery .....	57.00-58.00

## NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	49.00-50.00
No. 2 heavy melting...	46.00-47.00
No. 1 bundles .....	49.00-50.00
No. 2 bundles .....	40.00-42.00
Machine shop turnings...	29.00-30.00
Mixed borings, turnings...	30.00-31.00
Short shovel turnings...	32.00-33.00
Low phos. (structural & plate) .....	50.00-52.00

### Cast Iron Grades

No. 1 cupola .....	47.00-48.00
Unstripped motor blocks .....	32.00-33.00
Heavy breakable .....	46.00-47.00

### Stainless Steel

18-8 sheets, clips .....	320.00-325.00
18-8 borings, turnings...	150.00-160.00
430 sheets, clips, solids .....	120.00-125.00
410 sheets, clips, solids .....	100.00-105.00

## BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	47.00-47.50
No. 2 heavy melting...	39.00-40.00
No. 1 bundles .....	46.00-47.00
No. 2 bundles .....	36.50-37.50
Machine shop turnings...	26.50-27.50
Mixed borings, turnings...	27.50-28.00
Short shovel turnings...	29.00-29.50
No. 1 cast .....	45.00-45.50
Mixed cupola cast .....	42.00-42.50
No. 1 machinery cast .....	47.00-47.50

## BUFFALO

No. 1 heavy melting...	47.00-48.00
No. 2 heavy melting...	43.00-44.00
No. 1 bundles .....	47.00-48.00
No. 2 bundles .....	40.00-41.00
No. 1 busheling .....	47.00-48.00
Mixed borings, turnings...	33.00-34.00
Machine shop turnings...	31.00-32.00
Short shovel turnings...	35.00-36.00
Cast iron borings .....	35.00-36.00
Low phos. .....	49.00-50.00

### Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola .....	47.00-48.00
No. 1 machinery .....	50.00-51.00

### Railroad Scrap

Rails, random lengths...	58.00-59.00
Rails, 3 ft and under .....	60.00-61.00
Railroad specialties .....	51.00-52.00

## CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	49.00-50.00
No. 2 heavy melting...	42.00-43.00
No. 1 bundles .....	49.00-50.00
No. 2 bundles .....	40.00-41.00
No. 1 busheling .....	49.00-50.00
Machine shop turnings...	34.00-35.00
Mixed borings, turnings...	30.00-31.00
Short shovel turnings...	36.00-37.00
Cast iron borings .....	30.00-31.00
Low phos., 18 in. .....	58.00-59.00

### Cast Iron Grades

No. 1 cupola .....	47.00-48.00
Heavy breakable cast .....	45.00-46.00
Charging box cast .....	45.00-46.00
Drop broken machinery .....	56.00-57.00

### Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
Rails, 18 in. and under .....	68.00-69.00
Rails, random lengths .....	61.00-62.00

## ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	41.50-44.50
No. 2 heavy melting...	39.00-41.00
No. 1 bundles .....	43.00-44.50
No. 2 bundles .....	35.00-37.50
Machine shop turnings...	28.00
Short shovel turnings...	28.00

### Cast Iron Grades

No. 1 cupola .....	47.00
Charging box cast .....	44.00
Heavy breakable cast .....	42.00
Unstripped motor blocks .....	42.00
Brake shoes .....	44.00
Clean auto cast .....	48.00
Stove plate .....	41.00

### Railroad Scrap

No. 1 R.R. heavy melt.	55.50
Rails, 18 in. and under .....	67.00
Rails, random lengths .....	65.00
Rails, rerolling .....	71.00
Angles, splice bars .....	63.00

## SEATTLE

No. 1 heavy melting...	48.00
No. 2 heavy melting...	44.00
No. 1 bundles .....	40.00
No. 2 bundles .....	25.00
No. 3 bundles .....	25.00
Machine shop turnings...	15.00-16.00
Mixed borings, turnings...	15.00-16.00
Short shovel turnings...	15.00-16.00
Electric furnace, No. 1 .....	55.00

### Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola .....	50.00
Heavy breakable cast .....	40.00
No. 1 wheels .....	35.00
Unstripped motor blocks .....	33.00
Clean motor blocks .....	40.00
Stove plate (f.o.b. plant) .....	35.00
Brake shoes .....	35.00

### Railroad Scrap

Rails, random lengths...	33.00
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## LOS ANGELES

No. 1 heavy melting...	39.00
No. 2 heavy melting...	37.00
No. 1 bundles .....	39.00
No. 2 bundles .....	33.00
Machine shop turnings...	18.00

### Cast Iron Grades (F.o.b. shipping point)

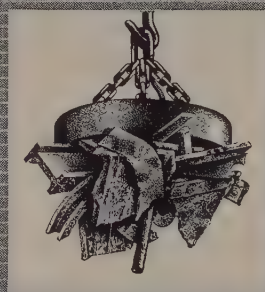
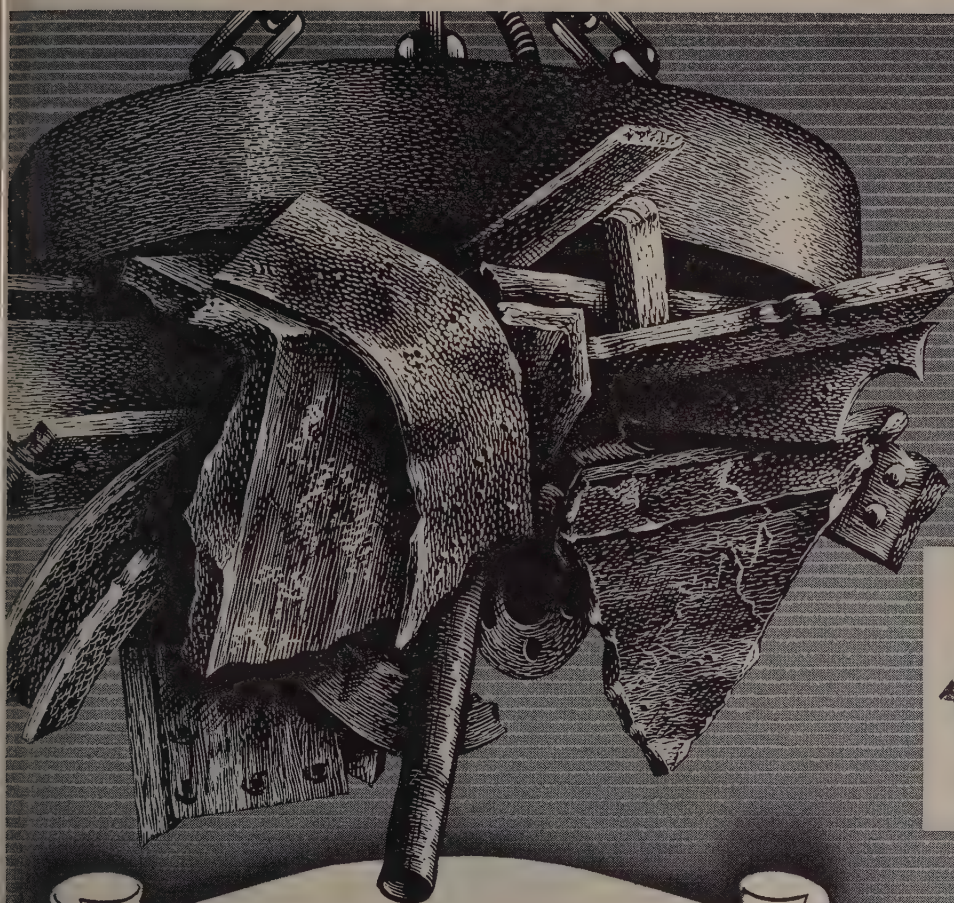
No. 1 cupola .....	48.00
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## SAN FRANCISCO

No. 1 heavy melting...	44.00
No. 2 heavy melting...	42.00
No. 1 bundles .....	44.00
No. 2 bundles .....	38.00
No. 1 busheling .....	44.00
Machine shop turnings...	23.00
Mixed borings, turnings...	23.00
Cast iron borings .....	23.00
Short shovel turnings...	25.00
Cut structurals .....	46.00
Heavy turnings .....	25.00
Punchings & plate scrap .....	44.00

### Cast Iron Grades





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IN IRON & STEEL SCRAP  
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(Concluded from page 125)

buying prices on No. 1 heavy melting steel \$2.50 a ton to \$49.50. They expect a further rise. A local mill has not entered the market, but prices are being strengthened by activity elsewhere.

**St. Louis**—Brokers' buying prices took a sharp upsurge as a result of higher price schedules put into effect Jan. 4 by the two major mills in this area, Granite City Steel and Laclede Steel. The increases ranged from \$3 on No. 1 heavy melting to \$1 on various cast iron grades. No. 2 heavy melting and bundles, as well

as virtually all cast iron grades, showed a notable boost.

There is not enough local scrap to supply the two mills. They were losing No. 1 heavy melting and some bundles to other districts.

**Birmingham**—While some buying is reported, the market is quiet for the most part. One large consumer of open-hearth material was forced to halt incoming shipments temporarily because they were coming in too rapidly to handle. Some dealers think further price advances are in prospect. They are accepting orders for only limited quantities. Others are

shipping material from their yards as quickly as possible. Yard receipts are substantial.

**Los Angeles**—District mills are increasing their purchases of the No. 1 grades of scrap, but demand for other grades is off from a year ago. Prices in the area are holding at levels recently established.

**San Francisco**—Steel scrap prices have moved up another \$1 to \$4 a ton all along the line, with the top grades commanding \$44. Some categories are quoted at all-time high. Consumption is running at a high level, and there has been some delay in shipments from northern California, recently hit by floods.

**Seattle**—The higher prices recently effected in this market are being maintained. Strength is attributed to a combination of heavy domestic consumption, active exporting and decline in receipts due to unfavorable weather at interior points which hampers collections.

## Canada . . .

Dominion Foundries & Steel Ltd., Hamilton, Ont., increased prices of two products (effective Jan. 3). Hot-rolled plates are up \$10 per short ton to \$107 and hot-rolled sheets, \$1 to \$95. The increases were attributed to higher scrap prices—now \$15 a ton above those quoted at this time a year ago.

## Structural Shapes . .

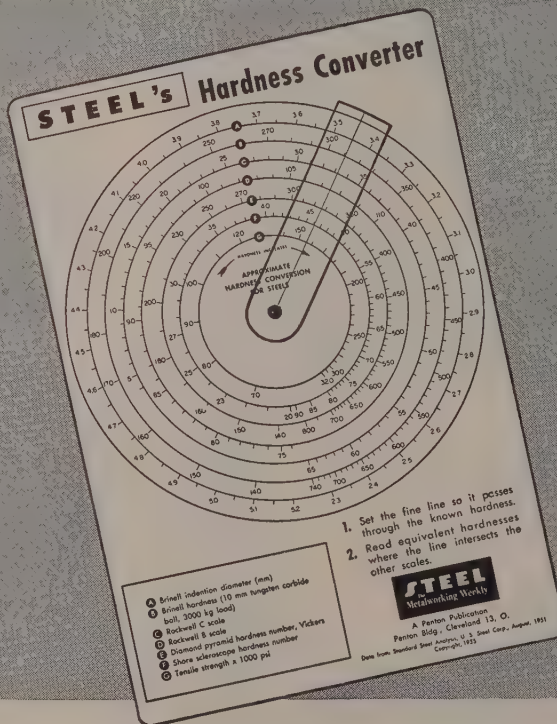
Structural Shape Prices, Page 112

The proposed \$100-million Palace of Progress building atop the Pennsylvania station in New York has been abandoned in favor of a plan to spend \$300 million to \$500 million on the redevelopment of a 40-acre area on the west side of Manhattan, according to William Zeckendorf, president, Webb & Knapp Inc., real estate operators that are promoting the project.

The development, as planned, will run from Ninth Ave., between 30th and 35th streets, to the Hudson river with an extension north between Eleventh Ave. and the Hudson river running to 38th street.

Mr. Zeckendorf said the development would be the city's most important center of commerce, recreation and communication. There will be ten buildings with a total of 11 million sq ft. A tower rising 1750 ft above a central plaza would serve as an observation point for defense and other activities.

The program has been submitted



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Makes it possible for you to convert any known steel hardness in a matter of seconds.

- (1) Set the fine line on the plastic rider so that it passes through the known hardness.
- (2) Read equivalent hardness where the line intersects the other scales.

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city officials for approval.

This spectacular project will require thousands of tons of structurals when, and if, it gets under way. It is only one of many proposals that promise to enliven the structural steel market well into the future.

Current structural inquiry continues heavy. Booked well ahead, fabricators are figuring new work selectively. The larger shops are booked up anywhere from 8 to 12 months. Road and bridge construction is outstanding, but public utility work also is prominent along the eastern seaboard.

Bridge contracts placed in New England by mid-January approximate 10,000 tons, exclusive of an 11,000-ton span at Bridgeport, Conn. Contractors are placing bridge steel for fabrication promptly after jobs are awarded. Several that delayed, shopping for better prices, find deliveries moved out several months while they were dickering for bargains unsuccessfully. Heavy tonnage contract deliveries extend ten months and into 1957 in some instances.

Shapemakers are still in arrears on deliveries—a month and longer in some cases. Wide flange beams will continue hard to obtain during second quarter when many construction firms will be trying to acquire steel for specific building projects.

Fabricators in the Pacific Northwest, contrary to the situation in the East, are actively seeking new work. Their backlogs were low at year end. Pending tonnages in the area are reported larger than normal and several sizable awards are scheduled for early action.

Los Angeles city and county construction volume for 1956 will approach \$500 million, a new construction record for that area.

Midwestern fabricators are booked solidly through the first half of the year, and they anticipate full order books for the last half. Big highway programs scheduled in the area are the basis for this expectation. A year ago, leading fabricators were able to promise delivery in four to five months. Today, promises run a full year and longer.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

2660 tons, approach work, Patapsco tunnel, contract TT-103, Baltimore, through Buckley & Co. Inc., Philadelphia, to Harris Structural Steel Co., New York.

2000 tons, south wing, Riverside church, Riverside drive and 119th street, New York, to Harris Structural Steel Co., New York.

300 tons, addition to pumping facilities, Han-

# SALES ENGINEER

## LOW TEMPERATURE PROCESSING

This integrated engineering and manufacturing firm has increased its annual sales volume 600 per cent in five years to eighteen million dollars. The chemical, petroleum and metallurgical industries now depend on low temperature processing as an integrated part of their expansion plans requiring oxygen, nitrogen, argon, hydrogen, carbon monoxide, methane, and other high purity low molecular weight gases and hydrocarbons.

The company is seeking an ambitious, self-energizing, young engineer who is capable of participating in large scale contract negotiations with engineering and management personnel for the sale or lease of complete processing systems. This is an excellent opportunity to progress into management responsibility with the country's leading company in this new and rapidly growing field. Previous sales experience not necessary. Salary and profit sharing. Send application to B. H. Van Dyke.

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SEEK GENERAL MANAGER  
GOOD SALARY AND FUTURE

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PENTON BLDG. CLEVELAND 13, OHIO

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STEEL JOBBERS IN  
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OUR EMPLOYEES KNOW OF THIS AD  
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EQUIVALENT, MANUAL OR POWER, FOR  
16" I.D. COILS, 36" O.D. MAXIMUM.  
1200 LB. MAXIMUM COIL SIZE.

ATHENIA STEEL DIVISION  
National Standard Co.  
Clifton, New Jersey

## CLASSIFIED

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Furnaces & Plating Equipment  
Complete—Like New  
Immediate Delivery.

G.E. ROLLER HEARTH 465 KW, 1650 deg. F, 5' wide, 13" high, 20' long & 40' cooling.

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4000 CFH. EXO GEN. w/each above furn.

YOUNG BROS. GAS RECIRC. CONV. BELT, 1000 deg. F, 6' wide, 24" high, 45' lg. NEW.

500 C.F.H. Westinghouse Endothermic Gen. SURF. COMB. GAS BOX, 30" wide, 18" high, 36" long, 1800 deg. F.

SURF. COMB. GAS BOX, 4' 6" wide, 12' long, 30" high, 1850 deg. F.

2,000 ft. Mechanical Handling System No. 458 Chain with trolley & clevis assemblies.

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## STEEL

Penton Building

Cleveland 13, Ohio

ford Works, to Isaacson Iron Works, Seattle; Morrison-Knudsen Co. Inc., Seattle, general contractor.  
300 tons, manufacturing building and warehouse, R. T. French Co., Souderton, Pa., to Easton Steel Structures, Easton, Pa.  
115 tons, steel bridge, Berks county, Pa., to A. B. Roth & Co., Lancaster, Pa.

#### STRUCTURAL STEEL PENDING

9000 tons, municipal power plant, Memphis, Tenn.; bids asked.  
2105 tons, 15 bridges, Connecticut turnpike, East Haven-Branford, Conn., project 319-01; bids to Hartford, Conn.; also 1335 tons, concrete reinforcing bars; 890 tons, steel piles and 500 tons of mat reinforcing.  
1850 tons, 12 grade separation structures, Connecticut turnpike, Branford-Guilford, Conn., project 320-01; also 800 tons of concrete reinforcing bars and 135 tons of steel piles.

1440 tons, five nose wing hangars, Elmendorf Air Base, Alaska, to Baker-Ford Co., Bellingham, Wash., low at \$3,418,110.  
900 tons, section, Brooklyn-Queens expressway, New York, bids asked; plans available through the office of the Borough of Queens.  
710 tons, angles, channels and plain beams, grade M, medium; bids Jan. 18, Air Force Base, Topeka, Kans., contracting officer.  
500 tons, County-City building, Tacoma, Wash., 10-story, \$6-million project; bids to Pierce county commissioners, Feb. 14.  
435 tons, three bridges and culverts, Fall River-Boston expressway, Brockton-Avon-Stoughton, Mass., section; S. & M. Co., Inc., Providence, R. I., low on general contract; also 270 tons of concrete reinforcing bars.  
335 tons, Eagle Gorge dam railroad relocation, Seattle; general contract to Morrison-Knudsen Co. Inc., Seattle, at \$2,083,754 to the U. S. Engineer.  
100 tons, military projects, Elmendorf Air

Base, Alaska; general contracts placed.  
Unstated, hoists, controls, etc.; Gorge high dam, Skagit project; bids to Seattle Feb.

#### REINFORCING BARS . . .

##### REINFORCING BARS PENDING

400 tons, Elson Air Base, Alaska, installation; general contracts awarded.  
100 tons or more, packaging and warehouse buildings, Sick's Brewing & Malting Co., Seattle; bids in Jan. 12.  
Unstated, addition to YMCA building, Salem, Ore.; general contract to Vieski & Pos, Salem, low at \$397,075.  
Unstated, Oregon road projects, general contracts awarded: Lane county, tunnel, Gibbons & Reed, Portland, Ore., low at \$616,641; Nehalem river bridge, Workman & Wilson, Canby, \$124,720; 39th Ave. overcrossing, Portland expressway, to Lord Bros, Portland, Ore., low at \$294,444.

#### PLATES . . .

##### PLATES PENDING

4110 tons, government furnished; also 5 tons of sheet piling, Ice Harbor lock and dam, Snake river; bids to U. S. Engineer, Walla Walla, Wash., Feb. 16; Schedule No. 56-40.  
1615 tons, hull plates, medium grade; bids Jan. 18, Air Force Base, Topeka, Kans., contracting officer.  
170 tons, fuel storage tank, Oxnard Air Force Base; bids Jan. 18, Corps of Engineers, Los Angeles.  
170 tons, two 5000-bbl fuel storage tanks, naval air station, Brunswick, Ga.; bids Jan. 31, Sixth Naval District, Charleston, S. C.  
Unstated, 3175 ft of sheet steel piling, proposed terminal bulkhead near Pasco, Wash., Snake river; permit applied for.  
Unstated, fuel storage facilities, Elmendorf Air Base, Alaska; general award to Pacific Alaska Contractors Inc., Tacoma, Wash., low at \$671,421.

#### PIPE . . .

##### CAST IRON PIPE PENDING

1195 tons, 8 and 24 in., Latham Water District, Colonie, N. Y.; bids Jan. 26, contractor's letting.  
550 tons, 12 and 16 in., Arlington county, Va.  
50 tons, various sizes; bids in at Clackamas, Ore.

#### RAILS, CARS . . .

##### LOCOMOTIVES PLACED

Denver & Rio Grande Western, twelve 1750-hp diesel-electric road switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.  
Union Pacific, twenty-five 1000-hp diesel-electric switching units to Alco Products Inc., New York.

##### RAILROAD CARS PLACED

Chicago & North Western, 1201 boxcars to the Pullman-Standard Car Mfg. Co., Chicago.  
Detroit & Toledo Shore Line, 100 fifty-ton steel boxcars to General American Transportation Corp., Chicago.  
Pennsylvania, 11,200 freight cars to own shops mostly, if not all, to Altoona, Pa. Ls comprises 5500 hoppers, 3300 boxcars, 170 gondolas and 700 flatcars.  
Reading, 1000 fifty-five-ton hoppers and 50 seventy-ton hoppers to Bethlehem Steel Co., Bethlehem, Pa.; these are in addition to 1400 placed since Nov. 1 and reported previously.  
Southern Railway, 246 cars, with 225 fifty-ton boxcars and 6 seventy-ton hoppers going to the Pullman-Standard Car Mfg. Co., Chicago, and 15 ninety-ton depressed center flatcars to the Thrall Car Mfg. Co.  
St. Louis-South Western, 950 freight cars with 700 fifty-ton boxcars going to the Pullman-Standard Car Mfg. Co., Chicago.  
200 seventy-ton fixed-end gondolas to the Bethlehem Steel Co., Bethlehem, Pa., and 50 fifty-ton flatcars to the Greenville Steel Car Co., Greenville, Pa.

##### RAILS PENDING

Missouri Pacific, 30,660 tons.

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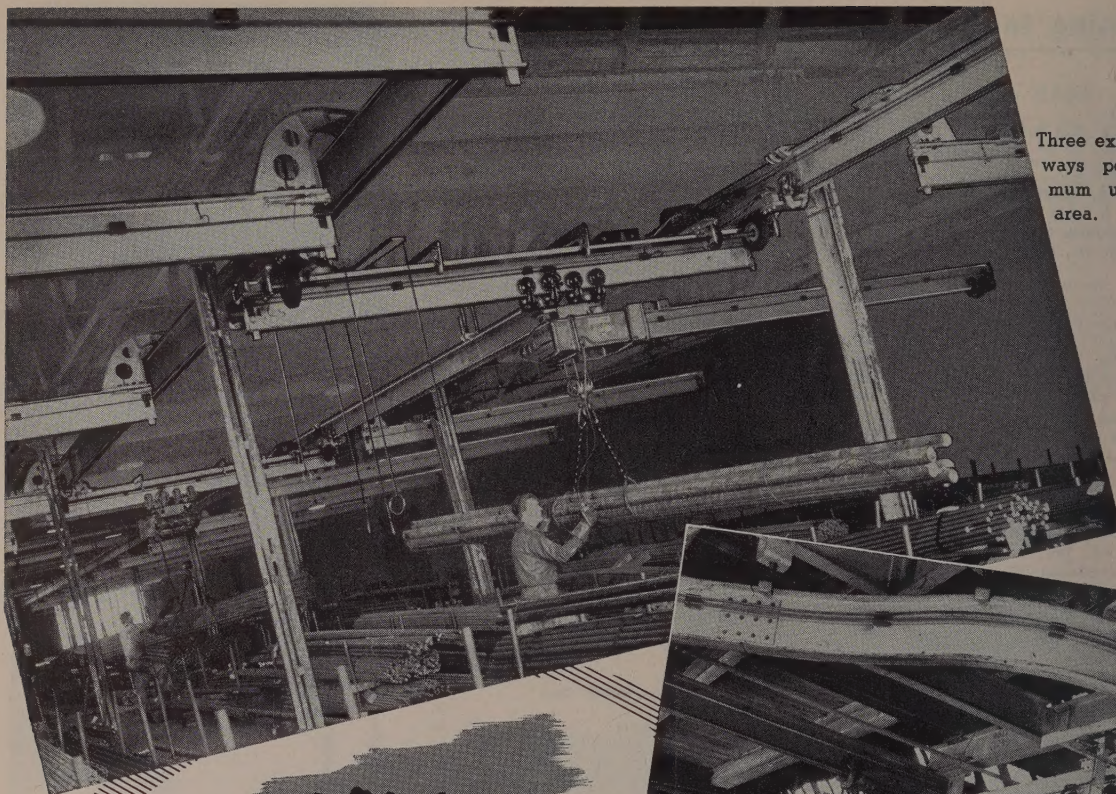
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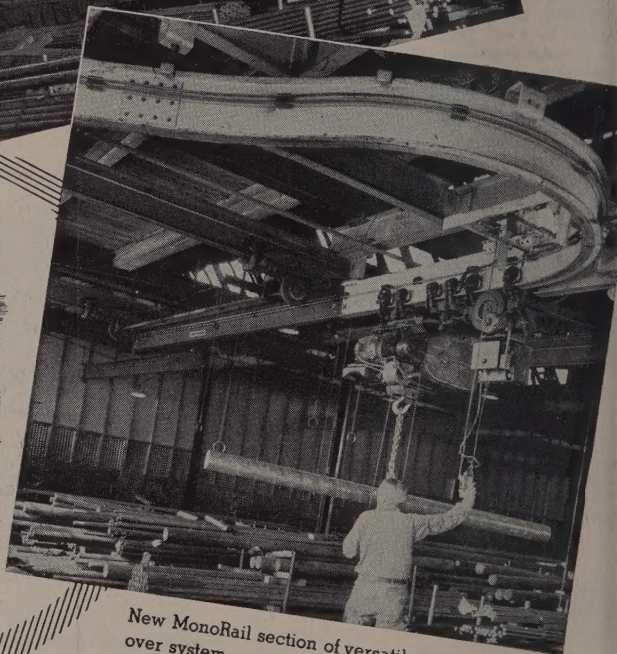
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Three existing crane ways permit maximum use of floor area.

# new MONORAIL ties into old... for flexible system



New MonoRail section of versatile up-and-over system.

A newly engineered section was added to three existing MonoRail craneways in this bar stock warehouse. As a result, incoming material can be picked up from a car and transported on this highly efficient overhead system to storage area. When the raw stock is needed, this up-and-over system has it there on schedule. If you have a materials handling problem, call your nearby American MonoRail engineer. He is qualified to help you answer it.

Member of Materials Handling Institute - MonoRail Association

Photos courtesy of Super Steels, Inc., Chicago, Ill.



AMERICAN

OVERHEAD  
HANDLING  
EQUIPMENT

# MonoRail

COMPANY

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first name in special purpose steels

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WHEN Wheeling Steel purchased this hot-strip mill in 1927, they specified Timken® tapered roller bearings for the roll necks on the work rolls and back-up rolls. These bearings have given extremely satisfactory service for the past 29 years while using economically applied, low-cost grease for bearing lubrication.

Their experience with grease-lubricated Timken bearings proves that there's no loss of lubricant during roll changes. Moreover, rolls can be changed in less time. And Timken bearings make closures more

effective and reduce loss of lubricant because they keep the roll neck concentric with its chock.

Using Timken bearings will simplify mill designs all around. No special thrust units are needed because Timken bearings take both radial and thrust loads in any combination.

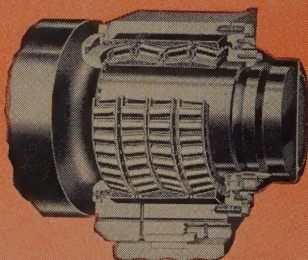
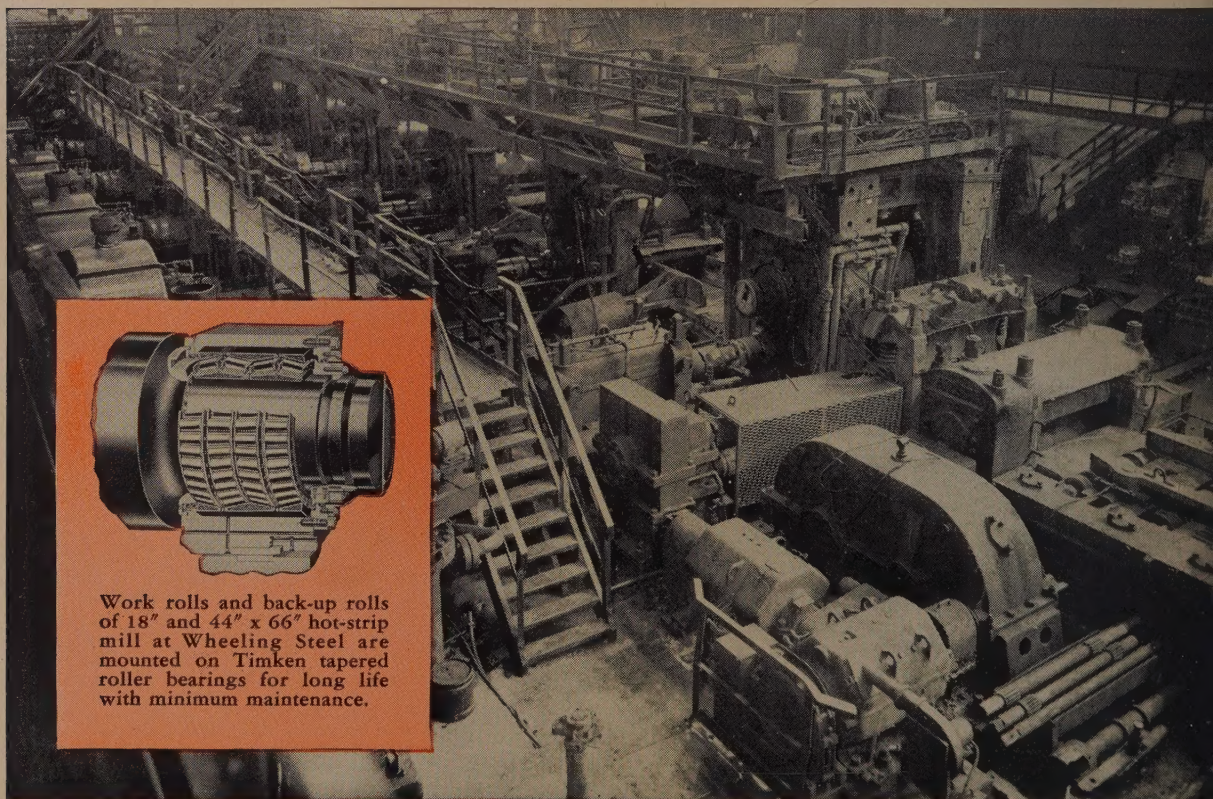
Timken bearings have exceptionally low frictional resistance—the result of true rolling motion based on proper geometric design and precision manufacture. This low friction reduces starting resistance and permits mills to accelerate more rapidly.

Higher mill speeds are possible. Skidding or scuffing between work roll and back-up roll is reduced.

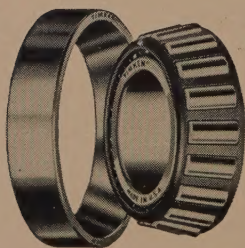
Timken bearings can be applied to machinery of any type to make it run better and last longer. Look for the trade-mark "Timken" on the bearings in the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



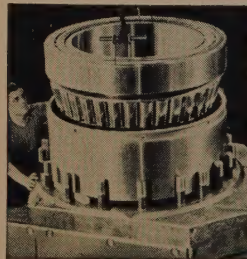
*This symbol on a product means its bearings are the best.*



Work rolls and back-up rolls of 18" and 44" x 66" hot-strip mill at Wheeling Steel are mounted on Timken tapered roller bearings for long life with minimum maintenance.



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TRADE-MARK REG. U. S. PAT. OFF.  
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